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TUBERCULOSIS OF THE HIP IN CHILDREN

JOSEPH S. BARR, M.D.

BOSTON

The data and conclusions of this paper are derived from the study of the records and roentgen examinations of 106 consecutive cases admitted to the New England Peabody Home for Crippled Children with a diagnosis of tuberculosis of the hip.

DIAGNOSIS

In 15 per cent it was later found that an incorrect admission diagnosis had been made. It is most important to exclude such cases, as they have in general a much more favorable prognosis than tuberculosis of the hip.

The ninety remaining cases were accepted as tuberculosis for one or more of the following reasons:

1. Positive guinea-pig test from material removed by aspiration or operation. Twenty-nine cases, or 32 per cent, were proved by this method.

2. Positive evidence of tuberculosis on pathologic examination of material removed at operation. In seventeen of the twenty-two cases in which pathologic material was examined, the histologic diagnosis was tuberculosis. The remaining five were reported as chronic inflammation not definitely characteristic of tuberculosis.

3. Positive intradermal (Mantoux) test with a clinical course of progressive destruction of the hip and the other characteristic features of acid-fast infection in the hip joint. In the sixty-six cases in which the Mantoux intradermal tuberculin test was done it was positive in dilutions of 1:1,000 or higher in every instance. The other cases had been discharged before this test came into vogue. Our experience with the use of graded tuberculins leads us to believe that every case of active tuberculosis will show a skin reaction in dilutions of 1:1,000 or higher.

The average age at onset was 4 years. In 60 per cent of the cases the onset was prior to the age of 6.

TREATMENT

In the forty year period that has elapsed since the first case in this series was admitted with this diagnosis, the treatment has varied with the prevailing medical fashion. Until 1920 the treatment was expectant. The child was ambulatory except when unable to be up. The Bradford and Taylor hip splints were commonly used. Abscesses were often evacuated operatively, the cavity was wiped out with gauze and sinuses were dressed with little attention to asepsis. Plaster spicas were used for long periods of immobilization.

During the ten years 1920-1930 the heliotherapeutic regimen of Rollier held sway. In every acute case the patient was placed on a Bradford frame and the hip immobilized by adhesive extension. No surgery was performed. The abscesses were allowed to rupture spontaneously. The patient's skin was exposed to the sun's rays, often supplemented by the quartz or carbon arc lamps. The progress of the disease was checked every six weeks by x-ray and physical examinations. The patient was allowed up only after all signs and symptoms of active disease had subsided. A number of cases were deliberately "overtreated," absolute bed care being maintained for as long as two years after the process had become quiescent.

In 1930, cautiously and belatedly following our New York brothers, we began to supplement the Rollier treatment with arthrodesis of the hip.

We have tried both conservative and operative methods without prejudice in a hospital with every facility for adequate prolonged care of the patient. An attempt has been made to ascertain by physical and x-ray examination the present condition in every case.

MORTALITY

There are two main causes of death. The first is tuberculous meningitis, which accounted for 47 per cent of the mortality. It occurs usually within the first two years after the onset. The blood stream infection that causes the hip disease may also account for the meningitis. It is quite probable that the mortality due to meningitis is about the same no matter what type of therapy is instituted. Complete bed rest might be of value, but there is no definite evidence that it has any effect in lowering the mortality rate of meningitis. Arthrodesis of the hip might possibly increase the mortality from this cause; it could hardly lower its incidence.

Deep seated secondary pyogenic infection of tuberculous sinuses with resultant amyloid disease and cachexia is the other great cause of death in tuberculosis of the hip. It accounted for six cases, or 40 per cent, of the deaths in this series. This deplorable complication, which is so commonly fatal, is almost if not entirely preventable. If no other point is made in this paper it will be worth while if I can draw attention to these facts.

(*a*) Tuberculous soft tissue abscesses develop from tuberculous hips in a very high percentage of cases (60 per cent in this series) at some stage in the evolution of the disease, no matter what treatment is used.

(*b*) These abscesses are occasionally absorbed without breaking through the skin but usually rupture through the skin.

(*c*) If a tuberculous sinus does not become secondarily infected it will always heal spontaneously.

From the New England Peabody Home for Crippled Children, Newton Centre, Mass.

Read before the Section on Orthopedic Surgery at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 15, 1936.

When a cold abscess becomes superficial, the skin over it is cleansed carefully with soap and water and alcohol and a sterile dressing applied. We usually aspirate the abscess to obtain material for diagnostic purposes. Otherwise we allow it to rupture spontaneously. The dressings are changed as often as necessary, twice daily if the drainage is copious. The skin is cleansed with alcohol and is protected from maceration with boric strips. We use no irrigating solutions, tubes or wicks. Careful dry sterile dressing is all that is necessary. Since this regimen was instituted at the New England Peabody Home for Crippled Children, no sinus has failed to heal spontaneously, usually within a few months after rupture. The deaths from secondary infection in this series occurred in cases treated before this regimen was used or in cases in which secondary infection had already occurred when they were admitted.

The treatment of sinuses that are already secondarily infected is a problem not yet solved. We believe that judicious surgery to insure adequate dependent drainage is indicated in most instances. Amyloid disease already present will regress if the deep seated infection is controlled.

BIOPSY, JOINT EXPLORATION AND ASPIRATION

Suspected cases of tuberculosis of the hip often present great difficulty in early diagnosis. Clinical and x-ray examination may present no absolutely positive diagnostic points. I believe that aspiration may be justified in those circumstances in an attempt to obtain material for examination. Our experience with biopsy and joint exploration in early acute cases had led me to believe that they should not be done. Table 5 presents the data on which this statement is based.

TABLE 1.—*Final Diagnosis Made in 106 Cases Admitted to the Home as Tuberculosis of the Hip*

Final Diagnosis	Cases
Toxic arthritis	6
Legg-Perthes' disease	1
Tuberculosis of the trochanter	1
?Tuberculous rheumatism	1
Diagnosis unknown (not sufficient data)	7
Total	16 (15%)
Tuberculosis of the hip	90 (85%)

TABLE 2.—*Associated Tuberculous Lesions Other Than Tracheobronchial Glands in Ninety Cases of Tuberculosis of the Hip*

	Cases
Both hips	3
Spine	6
Other bone focus	7
Kidney	3
Lung	1
Cervical adenitis	2
Meningitis	7
Lupus	1
Total	30 (33%)

COURSE OF THE DISEASE

Tuberculosis of the hip, like tuberculosis elsewhere in the body, runs a most variable course. The evaluation of the effect of any given therapeutic measure is difficult, as the expected course of the disease in any given case cannot be certainly predicted. During the acute stage there is marked decalcification and haziness of bony detail of the ilium and femur. Its presence seems to indicate active disease. In addition to decalcification and possible increase in bone destruction, as shown by x-ray examination, the presence of involuntary muscle spasm on attempted motion of the hip and abscesses or sinuses are reliable indexes of an active process. The amount of actual bone destruction that occurs is extraordinarily variable. In some cases there is little or no bone destruction and the joint space is narrowed, allowing bony contact between the femur and the acetabulum but with the normal bone contour essentially unchanged. In other cases the head and most of the neck of the femur together with a large portion of the ilium may be completely destroyed. In over half of the cases, abscesses develop. Eventually, however, every case of tuberculosis of the hip, uncomplicated by secondary infection, passes from the acute into a chronic or arrested state. Muscle spasm disappears, sinuses are healed and there is no evidence of abscess formation. X-ray examination shows at least fairly normal bone density and no further spread of the destructive process. In some of the cases apparent bone cavities seem to fill up. The blood picture shows a return to normal of the monocyte/lymphocyte ratio.

In other words, an inevitable histologic sequence to a pathologic process has taken place; the tuberculous process has become walled off by a zone of local defense. A barrier of fibrous tissue prevents the absorption of toxic products. The spread of the destructive process is "arrested." It has not yet been demonstrated that a tuberculous hip is ever "cured"; i. e., that all the bacilli have been killed. Half of our cases became quiescent within two years after admission. All the cases were quiescent after four years of treatment.

TABLE 3.—*Present Status of All Cases*

	Well	Acute	Dead	Untraced	Total
Group 1 Cases treated before 1920; no fusion attempted	13	6	11	14	44
Group 2 Cases treated after 1920; no fusion attempted	4	1	3	1	9
Group 3 Fusion in the early stages of the disease	1	..	1	0	2
Group 4 Fusion after the disease became quiescent	25	1	0	0	26
Group 5 Still in home; acute or awaiting fusion	0	12	0	0	12
Total	43	20	15	15	93 Hips
	46%	21%	16.5%	16.5%	90 Patients

TABLE 4.—*Cause of Death*

Cause of Death	Cases	Duration of Life from Onset
Tuberculous meningitis	7	All within 4 years
Secondary infection, amyloid, and so on	6	5, 18, 18, 20 years
Pulmonary	2	
Total	15 16.6%	

HELIOTHERAPY

For over twenty years heliotherapy in the treatment of bone and joint tuberculosis has been used at the New England Peabody Home. The term heliotherapy is used in Rollier's sense of sunshine, bed rest, fresh air and the like.

The effect of the sun's rays on bone and joint tuberculosis has been stated by author after author to be extremely beneficial, even specific. Our [1] results do not verify these conclusions. We find that the blood picture, the roentgenograms and the clinical appearance of cases that have been treated intensively by sunshine, either natural or artificial, are no better than those of cases treated in the open ward with no direct solar irradiation.

We believe that complete rest, local and general, with a good general regimen such as is used in pulmonary tuberculosis does influence favorably the natural course of the disease. The natural course of the disease in an individual case may be mild or it may be extremely severe, but it is probably not appreciably influenced by intensive solar irradiation. A moderate amount of sunshine is of course good for almost any one, whether suffering from tuberculosis of the hip or not.

FUSION

Attempted arthrodesis in the early active stages of the disease is advocated by certain surgeons. Our follow-up study and comparison of our results with other published series leads us to believe that arthrodesis should not be attempted until the disease process is quiescent, as shown by physical and x-ray examination.

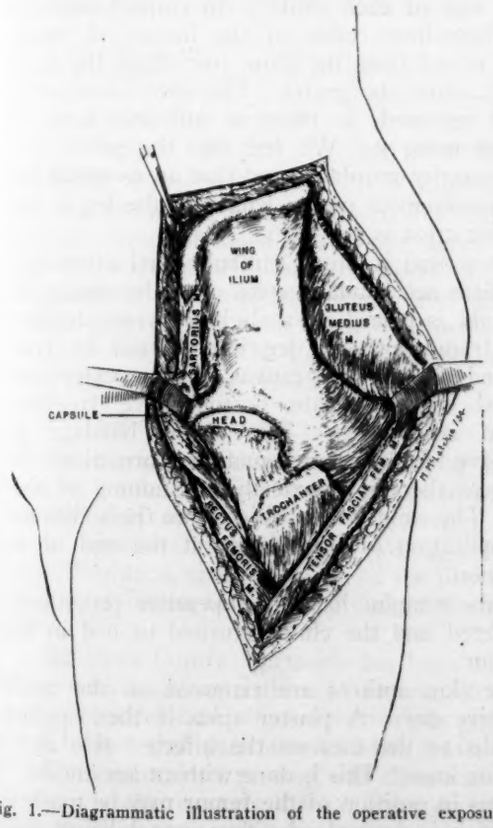

Fig. 1.—Diagrammatic illustration of the operative exposure.

To discuss all the arguments for and against attempted arthrodesis of the hip in the active stage of the disease would take me far beyond the limits of this paper. The more valid objections to fusion in the presence of active disease are that:

1. The mortality rate both operative and remote is much higher than in quiescent cases.

2. There is probably no more than 50 per cent [2] successful fusion, no matter what method is used.

Fig. 2.—Technic of removal of the grafts.

3. Even if fusion is successful, the focus can be eradicated only by the natural process of repair through local and general resistance to the disease. The "curative" effect of fusion is in fact simply the natural course of the disease toward an arrested state. That will occur inevitably, whether fusion is attempted or heliotherapy is instituted or any of the other purported "cures" are used.

TABLE 5.—*The Effect of Arthrotomy on the Mortality and on Sinus Formation*

	Mortality		Sinuses		No Sinuses		Secondary Infection		Amyloid	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Biopsy (wound closed) 9 cases	2	22	8	90	1	10	5	55	1	11
Incision and Drainage 5 cases	2	40	5	100	..	..	4	80	2	40
Total, 14 cases	4	28	13	93	1	7	9	64	3	21
cf. Total series, 90 cases	15	16.6	54	60	36	40	14	15	6	7

Our attempts to restore "arrested" cases to normal activity without surgery have been most disappointing. Reactivation of the process as shown by pain, muscle spasm, abscess formation, increasing deformity, and the like occurred frequently even after four or five years of complete bed rest. We believe that a fused hip

1. Barr, J. S.: Heliotherapy in the Treatment of Surgical Tuberculosis, New England J. Med. **208**: 131-134 (Jan. 19) 1933. Hoeffel, G., and Lyons, D.: Heliotherapy and the Peripheral Blood, Am. J. Dis. Child. **40**: 484-492 (Sept.) 1930.

2. Hallock, Halford, and Toumey, J. W.: Hip Joint Tuberculosis Treated by Fusion Operation, J. A. M. A. **103**: 1836-1840 (Dec. 15) 1934.

has a much better chance to remain arrested than one which has a little motion present. Rarely a conservatively treated patient will retain useful hip motion and the disease remain quiescent when full activity is allowed, but in most instances the amount of motion that is retained is useless and probably dangerous.

The treatment of bilateral tuberculosis of the hip is difficult. A satisfactory result was obtained in one case by arthrodesing one hip and doing a Jones pseudarthrosis in the other. A range of motion was thus obtained which permitted sitting, standing and walking.

OPERATIVE TECHNIC

Many methods of fusing the hip joint have been described. The reader is referred to Ghormley's [3] excellent article for a summary of those chiefly in vogue.

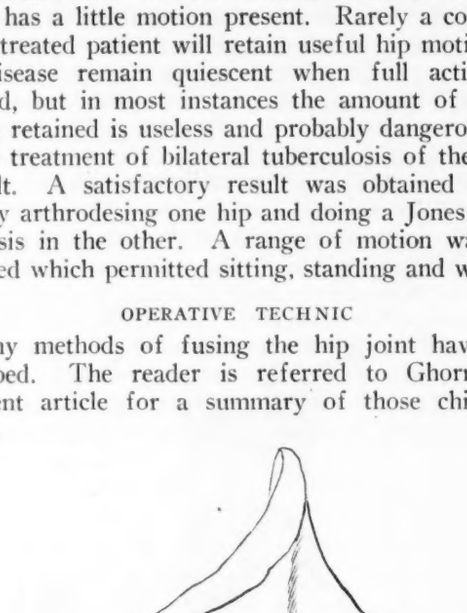

Fig. 3.—Grafts in position. In actual cases the grafts cover the neck of the femur farther anteriorly than is shown in the illustration.

Intra-articular arthrodesis, requiring dislocation of the head of the femur, excision of the articular cartilage and replacement of the denuded surfaces in contact, is mentioned only to condemn it. The mortality is high and successful fusion is obtained in less than half the cases. The massive graft, whether the technic is that of Hibbs, Albee, Chandler, Eikenbary or Ghormley, is technically difficult in children. There is considerable cartilage about the epiphysis of the great trochanter which may prevent bony apposition at this point. The attached abductor muscles may tend to displace the graft. The position of the leg must not be altered after the graft is placed because of the danger of losing bony contact. Exact maintenance of the position during closure of the wound and application of a plaster spica is not easy. For these and other reasons it was decided to use multiple flexible grafts from the ilium. At first the technic of Wilson [4] was used, bending the grafts over in "crown roast" fashion and leaving them attached just above the acetabulum. They tend to break as they are bent, thus leaving a vulnerable spot just above the joint line. With a growing realization that cancellous bone is the best of osteogenic material, we began cutting free grafts from the outer table of the ilium and placing them across the joint line.

We use tribrom-ethanol anesthesia (80 mg.) supplemented with ether. The hip joint is exposed through the Smith-Petersen incision. The capsule is incised longitudinally and dissected off the acetabulum and neck of the femur. The visible cartilage on the rim of the acetabulum and the head of the femur is removed, but no attempt is made to remove all the diseased tissue. With a sharp osteotome a cortical flap of bone is raised posteriorly, laterally and anteriorly from the neck of the femur and greater trochanter. These flaps are levered out carefully, being left attached inferiorly to the shaft of the femur. Three or four grafts are then removed from the wing of the ilium, each one from 3 to 5 inches long and from one-half to 1 inch wide and the thickness of the outer table of the ilium. The grafts are slid downward so that they surround the neck of the femur, the lower end of each one being firmly wedged beneath the raised femoral flaps. The upper end of each graft is in contact with the bare cancellous inner table of the ilium. A small "trap door" raised from the ilium just above the acetabulum is laid across the grafts. The anterior-superior spine is not removed, as there is sufficient bone available without using it. We feel that the pelvic contour is unnecessarily mutilated and that an essential landmark for measurement of the length of the leg is lost when the iliac crest is cut off.

The wound is closed carefully, and after application of a firm ace bandage spica over the sterile dressings the child is placed on a slightly hyperextended Bradford frame with the leg immobilized by from 5 to 8 pounds weight on a canvas stocking extension. This method of immediate postoperative treatment has several advantages. The elastic bandage prevents excessive bleeding and hematoma formation. In many instances there is practically no staining of the dressings. The child is not subjected to the additional shock of application of a wet cast at the end of a major operation.

Without undue haste the operative procedure can be completed and the child returned to bed in less than an hour.

The skin sutures are removed on the tenth postoperative day. A plaster spica is then applied from the ribs to the toes on the affected side and to the opposite knee. This is done without anesthesia. Minor changes in position of the femur may be made without pain if it is done slowly, thus immobilizing the hip in exactly the desired position.

The best position for the fused hip was found to be about 20 to 25 degrees of permanent flexion, from 0 to 15 degrees of abduction, and from 0 to 5 degrees of external rotation. It has been found necessary, in order to obtain that ultimate position, to place the leg

3. Ghormley, R. K.: Use of the Anterior Superior Spine and Crest of Ilium in Surgery of the Hip Joint, J. Bone & Joint Surg. **13**: 784-798 (Oct.) 1931.

4. Wilson, J. C.: Operative Fixation of Tuberculous Hips in Children, J. Bone & Joint Surg. **15**: 22-47 (Jan.) 1933.

in full extension with from 15 to 20 degrees of abduction; otherwise, flexion and adduction deformity was prone to occur, requiring later osteotomy for its correction. At the end of four months the patient is allowed to bear weight on the affected hip, using crutches and a single spica extending to the ankle. This apparatus is continued until solid fusion is demonstrated by x-ray examination. Prolonged physical therapy to develop good musculature and proper gait was necessary in most instances after the cast had been discarded.

Bony fusion of a hip once obtained changes the case from one of joint tuberculosis to tuberculosis of a long bone. The focus is not eradicated by the fusion and it is still necessary to rely on the natural body defense mechanism to produce complete arrest of the disease.

In most cases the juxta-articular fusion produced by operation is followed by eventual intra-articular fusion, but in certain instances the tuberculous process remains active and the destructive process continues to spread after bony fusion has been obtained. Such cases are

TABLE 6.—*Present Status of the Ninety-Three Hips*

Fused	Good position	19	
	Fair position	8	
	Poor position	1	
Total			28
Unfused	Good position	10	
	Fair position	12	
	Poor position	9	
Jones pseudarthrosis		1	
Total			32
Dead, unknown, and acute			33
Total			93

detected chiefly by x-ray comparison. It is important to follow all cases for a long period (at least five years) after fusion has been obtained. A false sense of security may be associated with fusion. There can be no muscle spasm or increasing deformity, and there is actually little pain present even when the disease is spreading in a fused hip. The danger signals have been removed but the danger remains.

OPERATIVE RESULTS

In twenty-three consecutive cases operation by this technic has been done. In two the end results are not available because they are too recent. There were no deaths and no operative complications (shock, sepsis and the like). Eighteen, or 86 per cent, of the patients have obtained solid fusion both clinically and by x-ray examination.

In one of the three failures operation has been done a second time with a second failure of fusion. Each failure has been checked carefully for the various possible causes. I believe that destruction of the grafts by extension of the tuberculous process was the cause in each instance. Areas of active disease were encountered in each of these cases at the time of operation.

SUMMARY AND CONCLUSIONS

Ninety cases of tuberculosis of the hip have been admitted to the New England Peabody Home for Crippled Children in the past forty years. The present status of all but sixteen of the cases is known.

Tuberculosis of the hip is often misdiagnosed (15 per cent of this series).

The chief causes of death are tuberculous meningitis and secondary infection of draining sinuses. For the first of these causes no therapy is available. The second one can be reduced to the vanishing point by scrupulous sterile dressing of sinuses and by refraining from any surgical intervention during the active stages of the disease.

Tuberculosis of the hip runs an extraordinarily variable course. Heliotherapy seems to have no specific curative effect on the disease. The word "cured" should be dropped for the more conservative "arrested." Fusion of the hip was successful in 86 per cent of a series of twenty-three consecutive cases. Failure of fusion was due apparently to extension of the disease to the grafts. In a few instances even after successful fusion in apparently arrested cases there was evidence of active disease present when the follow-up study was made.

Arrest of the disease with a useful range of motion occurs too rarely to make it an expected result in conservatively treated cases. Fusion is not a "cure" but offers the best chance for an arrested disease process to remain quiescent and give a stable weight bearing limb. We advise complete bed rest and interdict surgery during the acute stage of the disease, which may last from a few months to three or four years. The hip should then be fused and the case followed for at least five years longer. Under this regimen one may expect to reduce the mortality rate and to return almost all the remaining patients to fairly normal economic and social activity. This paper is not an "end result study." When these ninety patients shall all have died, I hope that some as yet unknown author will report the actual end results and plot graphically the course of the disease, which by that time will be a clinical rarity.

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ABSTRACT OF DISCUSSION

DR. JOHN C. WILSON, Los Angeles: My experience with biopsy has differed somewhat from that of Dr. Barr. I have not fused hips without a positive diagnosis of tuberculosis. The diagnosis of tuberculosis cannot be made in the early stages without examination of tissue under the microscope. I have not observed any serious disturbance following a biopsy, provided the biopsy was carefully done. Tissues, of course, must be handled gently. Tuberculosis may develop along the operative approach if the tissues are not properly packed off at the time the tuberculous focus is encountered. The period of rest prior to operation is of interest. I have not been able to obtain satisfactory rest of the tuberculous hip with mechanical devices. The operation is done to put the infected hip at rest, and an early fusion promotes early healing of a tuberculous joint. The early healing of the joint prevents a destruction of the capital epiphysis, which is of importance, because the preservation of this epiphysis limits the shortening. Dr. Barr has brought out another very important point with which I agree, that fusion of the hip transforms the tuberculosis from a joint infection to tuberculous infection of a long bone. In other words, tuberculosis is a constitutional disease, and the simple fusion or splinting of the hip in no manner effects a cure until the organism as a whole has supplied sufficient antibodies to build up resistance and produce healing.

DR. HALFORD HALLOCK, New York: The most important idea in Dr. Barr's paper is that he advises fusion as the treatment that will give the best prospect of a stable, weight bearing extremity free from disease activity. At the New York Orthopedic Hospital we gave up conservative treatment because we could not get results with it. In 1928 Smith and Watters (THE JOURNAL, Jan. 21, 1928, p. 189) reported the results obtained by this method in 150 cases. These were 47 per cent still active, 27 per cent quiescent, two patients free from symptoms

and with useful motion, and 24 per cent deaths. In 1934 Dr. Toumey and I (THE JOURNAL, Dec. 15, 1934, p. 1836) reported the results in 170 unselected cases treated by fusion; 87 per cent are fused; 8.2 per cent of the patients have died. Dr. Barr believes from his experience that biopsy should not be done. His figures for the patients subjected to biopsy alone are given in the accompanying table. In any comparative statistical study, one must determine what constitutes significant differences of percentage in relation to number of cases. In the study of fused hips, we set up the following standard: If the group of cases under analysis comprises less than one tenth of the whole series, 20 per cent is considered to be the least amount of difference to which significance can be attached; if from one tenth to one half, 15 per cent; if one half or over, 10 per cent. On this basis, Dr. Barr's figures indicate an

Comparative Results of Biopsy

		Mortality	Sinuses	Amyloidosis
Biopsy cases	9	22%	90%	11%
Total series	90	16.6	60	7
Percentage difference		5.4%	30%	4 %

increased hazard only in sinus formation. I believe that the establishment of the diagnosis is of supreme importance because of the necessity for accurate treatment; but before opening a suspected joint, I have permission to fuse if tuberculosis is proved. Dr. Barr states that in certain cases the tuberculous process remained active after fusion had been obtained. The subsidence of the disease does not immediately or rapidly follow on fusion, and for the complete replacement of the diseased area by healthy appearing bone, usually three to five years is required. If, however, roentgenographic intra-articular disease activity continues for six months or more after fusion has apparently been obtained, or if the ultimate result of fusion through the diseased area is not secured in from three to five years, I feel that that hip is probably not fused.

DR. J. S. BARR, Boston: The present status of the ninety cases is as follows: Twenty-eight of the hips are fused clinically and on x-ray evidence, and thirty-two are not fused. One patient has a Jones pseudarthrosis; thirty-three are dead or with an unknown or an acute condition. Bilateral tuberculosis of the hip still presents an extremely difficult problem. I have been unable to solve it; but I have approached one case in this manner. I did an arthrodesis on one side and a Jones pseudarthrosis on the other side. The boy is able to walk short distances without apparatus of any kind. Outdoors he carries a pair of crutches but uses them more for balance than for support. It is interesting to note that, after the pseudarthrosis was done, the hip developed complete intra-articular fusion on that side. Every one has his own pet method of fusing hips and assumes that, because he fuses them in a certain way, therefore the results are good. I have no particular brief for the method that I use. It is a slight modification of Dr. Wilson's method and I feel that it is an efficient one. I could show slides of a whole series which show, in general, fusions of that type. The point I am trying to make is that I believe that tuberculosis of the hip, like tuberculosis of the lung, is not a disease to be treated in a general hospital; that, when the diagnosis is made, the patient should be placed in a sanatorium and be put to bed. Then, when the disease becomes quiescent, the hip should be fused. Dr. Hallock said that they have given up conservative treatment in New York. I am quite certain he didn't mean that in the way he said it because, after a hip is fused, there is at least six months or a year of treatment in a plaster cast, and obviously that is conservative treatment. If the fusion doesn't take place intra-articularly for four or five years, he is still treating the patients conservatively, giving them bed rest and as much fresh air and sunshine as possible and a good general regimen which is known to be useful in tuberculosis. The only difference in opinion, I believe, between the two schools is that they feel that fusion actually hastens the process of repair. I believe that rest, with traction, in bed will produce that arrest about as quickly and with much less danger than will fusion done early in the disease.

MAINTENANCE OF NORMAL WATER EXCHANGE WITH INTRAVENOUS FLUIDS

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One of the most important advances in modern medicine is the ability to supply the sick patient with water, food and other chemicals when their normal ingestion from the gastro-intestinal tract has been disturbed. The need for and the value of this parenteral therapy are well established. Prolonged nausea and vomiting may warrant its use, or rest of the gastro-intestinal tract may be desired following operations on it, hemorrhages in it, or inflammations involving any portions of its length. Occasionally inanition may be so marked that fluid and food must be so supplied. In many instances this therapy is the chief aid in carrying a sick patient over a critical period of his illness, and fortunately in recent years physicians have done better in eliminating reactions from such treatment.

Opinions vary somewhat as to the choice of fluid for parenteral administration.[1] A number of factors are involved in the selection, but the fundamental proposition is that of supplying as nearly as possible what the patient needs. In the majority of cases water is of first importance, and our purpose in this paper is to present the results of an investigation on the efficiency of the commonly used solutions in maintaining a normal water exchange. A brief discussion of the amount given and its combination with dextrose and sodium chloride is in order.

From a series of studies on the water requirements of surgical patients, the quantity needed by them daily under various conditions of disease and treatment was determined.[2] A few statements from the data obtained will develop the reasons for the amount of fluid given to the patients of this study.

Water normally becomes available from fluids drunk and food eaten and is excreted in urine, in the stool, and by vaporization from the skin and lungs. In persons in whom the intake of fluid and food is stopped, available water is importantly affected. Ordinarily the food of a routine maintenance diet furnishes from 1,200 to 1,500 cc. of water daily, but in starvation rarely more than 500 cc. of water becomes available from the body material oxidized for energy, and with no fluids drunk this is all there is to balance the daily output. Practically, this amount is too small for consideration and can well be forgotten in estimations of the water needs of the seriously ill individual.

On the outgoing side, the surgical patient, the same as the healthy person, excretes water for two physiologic functions: the dissipation of heat by vaporizing water from the skin and lungs, and the excretion of waste materials in solution through the kidneys. The

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1. Cutter, R. K.: Use of Large Volume Intravenous Injections, J. A. M. A. **106**: 1250 (April 11) 1936.

2. Coller, F. A., and Maddock, W. G.: Water Balance in Surgical Conditions, Internat. Clin. **3**: 191 (Sept.) 1934; A Study of Dehydration in Humans, Ann. Surg. **102**: 947 (Nov.) 1935.

water loss in feces is insignificant in most surgical conditions and can generally be disregarded. Water vaporized by the average adult patient convalescing uneventfully amounts to from 1,000 to 1,500 cc. daily. The sick surgical patient, frequently the one with increased metabolism from hyperthyroidism or fever, vaporizes from 1,500 to 2,500 cc. daily, with a fair average of 2 liters a day. Water for urine is the next problem and should be an amount that will enable kidneys of various concentrating ability to excrete the daily waste materials presented to them without having to work at their maximum rate. For the sick surgical patient this should be a urine output of at least 1,500 cc. a day, and accordingly 1,500 cc. of water is allowed daily for this purpose. Then there may be abnormal losses of fluid to consider, such as by vomitus, drainage from intestinal or biliary fistulas, or sputum. To summarize, the amount of water to be given to the sick surgical patient to provide for his daily water excretions and thus to maintain body fluids at their normal level can be calculated as follows: (1) water for vaporization, 2,000 cc.; (2) water for urine, 1,500 cc.; (3) abnormal losses—vomitus, and so on; total, 3,500 cc.

If one is dealing with a dehydrated patient, this maintenance amount of water is not enough and some extra water must be provided to restore the fluid previously lost.[2] Since the subjects used in this study were not dehydrated, they were given about 3,500 cc. of intravenous fluids daily.

Dextrose should be supplied to all patients receiving parenteral fluids. When no food is taken by mouth, the glycogen supply of the body rapidly becomes exhausted. Fat, which then forms the main food, tends to be incompletely oxidized and the consequent accumulation of oxybutyric and diacetic acids results in ketosis. This faulty metabolism is prevented when dextrose is provided. The advantage of the protection afforded the liver by carbohydrates must also be considered, along with the value of the number of calories supplied.

The importance of administering sodium chloride solutions parenterally to some patients has been well established. The experimental work of Hartwell and Hoguet,[3] Orr and Haden[4] and McIver and Gamble[5] has demonstrated that, after the production of a high intestinal obstruction with its associated pernicious vomiting, the lives of animals could be continued indefinitely if they were given a sodium chloride solution intravenously, whereas untreated animals or those given other solutions, even if isotonic, were not saved. Clinical experiences in dealing with patients who have lost appreciable amounts of gastro-intestinal secretions from any cause have corroborated the unquestionable value of salt solution parenterally in such instances.

The two fluids most commonly used to restore lost electrolytes are physiologic solution of sodium chloride, which contains 8.5 Gm. of sodium chloride per liter, and Ringer's solution, which besides having 8.5 Gm. of sodium chloride also contains 0.3 Gm. of potassium chloride and 0.2 Gm. of calcium chloride per liter. Potassium and calcium ions have been shown to have a beneficial action on the heart beat, and their presence in Ringer's solution in approximately the same ratio to sodium as that of the blood serum is thought by some surgeons, notably Horsley,[6] to make Ringer's solution preferable to plain physiologic solution of sodium chloride.

From the work on intestinal obstruction, the value of saline solutions is so well known that there is a definite tendency to use them for all administrations of intravenous fluids. In 1924 Matas[7] pointed out that such a plan is not without serious drawbacks and dangers, degenerative changes in heart muscle and kidneys, and edema of the lungs being warned about in particular. To the alert observer, edema of the dependent portions of the body from the excessive use of salt solutions is not an uncommon observation in the surgical services. In 1933 Jones and Eaton[8] presented a review of thirty-four cases in which edema was noted postoperatively. Twenty-one of the patients had diseases of the gastro-intestinal tract, the most common being peptic ulcers, gastric malignant growths and perforated appendixes. In most instances the edema was of the dependent portions of the body. Five patients, however, had edema of the lungs, and one patient died from edema of the intestinal wall with resultant partial obstruction. It was thought that the most important element in the production of the edema in these cases was a low serum protein consequent to undernutrition. Additional factors considered to be of importance were the administration of excessive amounts of fluid and salt, profuse surgical drainage, the general effects of sepsis, and loss of serum protein by massive hemorrhage. Corroboration of the influence of these factors on the production of edema was obtained by these authors and White[9] in an interesting series of experiments on animals.

From observations over a period of several years on edema developing postoperatively, it was our impression that while many factors predisposed to the retention of fluids the precipitating factor was frequently the excessive use of sodium chloride solutions. Among other things, a study of the efficiency of the commonly used intravenous fluids in maintaining a normal water exchange offered a chance to substantiate this opinion.

METHOD

Three groups of sick surgical patients who could not or were not permitted to take anything by mouth and therefore needed fluids parenterally were selected for study. Each group received primarily 5 per cent dextrose in either physiologic solution of sodium chloride, in Ringer's solution or in distilled water. For one point of interest, a control group of patients in good general condition was studied. The fluid was given intravenously by the drip method at a rate of about 450 cc. an hour, this being the method preferred rather than subcutaneous infusions. None of the patients gave evidence of renal disease or cardiac decompensation. The study was generally started on the first postoperative day. In several instances after the effect of one solution was determined the fluid intake was changed to a different solution, given either intravenously or by mouth.

The procedure for the determination of the water exchange of surgical patients has been described previously.[2] In brief, we obtained the weight of the patient each morning at 8 o'clock, and the weights of

3. Hartwell, J. A., and Hoguet, J. P.: Experimental Intestinal Obstruction in Dogs, with Special Reference to Cause of Death and Treatment by Large Amounts of Normal Saline Solution, J. A. M. A. **59**: 82 (July 13) 1912.
4. Orr, T. G., and Haden, R. L.: Chemical Factors in Toxemia of Intestinal Obstruction, J. A. M. A. **91**: 1529 (Nov. 17) 1928.
5. McIver, M. A., and Gamble, J. L.: Body Fluid Changes Due to Upper Intestinal Obstruction, J. A. M. A. **91**: 1589 (Nov. 24) 1928.
6. Horsley, J. S.: The Intravenous Administration of Dextrose in Ringer's Solution, Ann. Surg. **100**: 678 (Oct.) 1933.
7. Matas, Rudolph: The Continued Intravenous Drip, Ann. Surg. **79**: 643 (May) 1924.
8. Jones, C. M., and Eaton, F. B.: Postoperative Nutritional Edema, Arch. Surg. **27**: 159 (July) 1933.
9. Jones, C. M.; Eaton, F. B., and White, J. C.: Experimental Postoperative Edema, Arch. Int. Med. **53**: 649 (May) 1934.

all intake and output for the next twenty-four hours. The water balance, including water vaporized from the lungs and skin, was then calculated for each day.

Blood chemistry studies considered to be desirable and carried out by standard methods were the total serum proteins, serum albumin, carbon dioxide combining power, chlorides and nonprotein nitrogen. The excretion of chlorides in the urine also was determined.

In deciding whether the water exchange was satisfactory, the weight of the patient each morning was used

Summary of Data

General Condition of Patient	No.	Weight, Kg.	Diagnosis; Operation	Serum Proteins, Gm. per 100 Cc.		Plasma CO_2 Comb. Power, Volumes per Cent		Plasma Chlorides, Mg. per 100 Cc.		Blood NPN, Mg. per 100 Cc.,	Intravenous Fluid, Daily Intake, 5% Dextrose in Physiologic Solution	Change in Weight,* Kg.	Fluid Changed to Daily Intake	Change in Weight, Kg.
				Total	Albumin	Beginning	End	Beginning	End	Beginning				
Sick Surgical Patients, 5% Dextrose in Physiologic Sodium Chloride Solution	1	53	Carcinoma of esophagus; gastrostomy	6.8	3.8	64	55	532	506	23.1	3,400 cc. for 4 days	Gain, 4.4	2,000 cc. diet by gastrostomy for 2 days	Loss, 3.6
	2	52	Carcinoma of rectum; colostomy	6.1	3.5	55	..	541	...	28.5	3,290 cc. for 3 days	Gain, 1.3	2,300 cc. diet by mouth for 1 day	Loss, 2.5
	3	57	Duodenal ulcer; posterior gastroenterostomy	5.1	3.4	66	62	406	474	....	3,700 cc. for 4 days	Gain, 7.2	3,790 cc. IV; 5% dextrose in water for 5 days	Loss, 6.7
	4	59	Duodenal ulcer; posterior gastroenterostomy	7.0	4.4	58	..	523	570	....	3,500 cc. for 2 days	Gain, 2.5	3,600 cc. IV; 5% dextrose in water for 4 days	Loss, 4.9
	5	63	Duodenal ulcer; posterior gastroenterostomy	7.2	4.6	67	..	415	532	36.3	3,500 cc. for 1 day	Gain, 1.4	3,500 cc. IV; 5% dextrose in water for 3 days	Loss, 2.9
	6	66	Acute infection of left elbow; drainage	5.8	3.4	56	..	576	...	29.4	3,400 cc. for 2 days	Gain, 1.7	General diet for 2 days	Loss, 1.4
Healthy Surgical Patients, 5% Dextrose in Physiologic Sodium Chloride Solution	6	66	Healed infection of left elbow; no operation	6.5	3.6	60	..	579	...	....	3,500 cc. for 2 days	Loss, 1.9		
	7	68	Inguinal hernia; repair	6.5	3.8	57	..	589	565	....	3,400 cc. for 3 days	Loss, 1.2		
	8	80	Peripheral vascular disease; no operation	8.0	4.5	..	..	548	610	....	3,470 cc. for 3 days	Loss, 1.5		
	9	44	Recurrent appendicitis; appendectomy	...	...	63	60	472	481	....	3,000 cc. for 2 days	Loss, 0.7		
	10	60	Inguinal hernia; repair	...	...	62	69	386	403	....	3,000 cc. for 2 days	Loss, 1.6		
Sick Surgical Patients, 5% Dextrose in Ringer's Solution											5% Dextrose in Ringer's Solution			
	11	43	Carcinoma of colon; resection	5.4	3.4	52	60	480	555	29.2	3,000 cc. for 4 days	Gain, 0.1		
	12	54	Fecal fistula; closure	7.1	4.1	57	62	550	557	32.0	3,286 cc. for 2 days	Loss, 0.8	3,080 cc. IV; 5% dextrose in physiologic solution for 1 day	Gain, 0.2
	13	54	Carcinoma of stomach; resection	5.0	2.6	55	50	553	624	26.1	3,460 cc. for 3 days	Gain, 0.1	2,980 cc. IV; 5% dextrose in physiologic solution for 2 days	Gain, 1.1
	14	83	Gastric ulcer; exclusion operation	6.4	4.0	71	54	509	658	36.0	3,296 cc. for 3 days	No change	3,060 cc. IV; 5% dextrose in physiologic solution for 3 days	Loss, 0.8
	15	76	Carcinoma of stomach; anterior gastroenterostomy	6.4	3.4	76	56	374	554	26.9	3,155 cc. for 2 days	Gain, 1.3	3,450 cc. IV; 5% dextrose in physiologic solution for 2 days	Gain, 1.7
	16	76	Cholecystitis, diabetes mellitus; cholecystectomy	6.2	3.4	33	50	582	609	25.4	3,050 cc. for 4 days	Gain, 3.0	Routine diabetic diet for 2 days	Loss, 3.4
	17	51	Chronic empyema; open drainage	6.0	3.1	58	62	554	604	34.1	3,030 cc. for 3 days	Gain, 3.4	General diet for 2 days	Loss, 2.6
Sick Surgical Patients, 5% Dextrose in Water											5% Dextrose in Water			
	18	55	Carcinoma of stomach; resection	5.6	2.7	68	57	518	511	....	3,450 cc. for 6 days	Loss, 3.7	2,700 cc. diet by mouth for 1 day	Loss, 0.7
	19	29	Appendicitis with peritonitis; no operation	...	...	..	..	...	...	....	3,293 cc. for 10 days	Loss, 2.3		
	20	42	Incarcerated inguinal hernia; repair	...	...	47	58	433	433	....	2,515 cc. for 2 days	Loss, 1.0		
	21	53	Gastric ulcer; excision of ulcer	6.0	3.9	54	55	518	497	24.6	3,334 cc. for 5 days	Loss, 3.3	2,883 cc. diet by mouth for 2 days	Loss, 1.1

* Change in weight of patient was used as a simple criterion of water exchange. Since the caloric intake was below maintenance requirements, a daily loss in weight should have occurred as a result of the oxidation of body substance for additional energy. A gain in weight or even a maintenance of body weight under these circumstances meant water retention.

as a simple criterion. In health an adult's weight is fairly constant, showing only minor variations from day to day as a result of water being retained or given up. The patients studied took no food by mouth and were undernourished. They received about 175 Gm. of dextrose daily in the intravenous fluid, but its calorific value was always less than the energy requirements and consequently some body glycogen, fat and protein were burned for additional energy. With the loss of these food substances and the water held by them, a daily loss in weight should occur, amounting to roughly 400 to 600 Gm. for an adult. A gain in weight or even a maintenance of body weight under such circumstances meant retention of water. Since the patients studied were not dehydrated, this addition of water would be an undesirable feature and indicative of a disturbed water balance. If great enough, clinical edema would appear.

RESULTS

The data for the twenty-one patients studied are shown in the accompanying table. The values given for the serum proteins were those obtained at the start of the study.

COMMENT

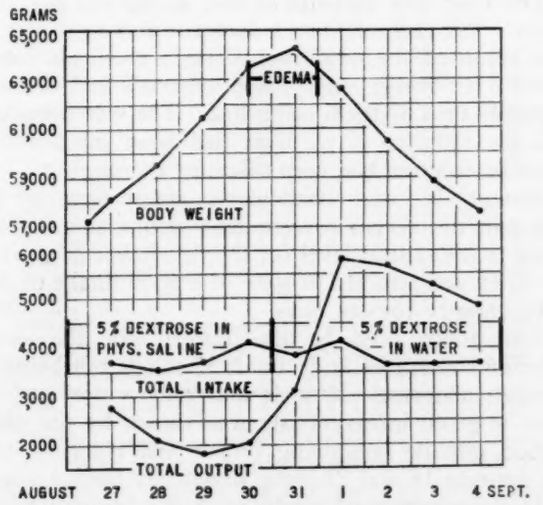
An investigation of this type is more complex than it appears to be at first glance, and many points of interest arise, particularly in relation to body chemistry. Comments have been largely limited, however, to facts significant to the purpose of this paper.

1. *Patients Receiving 5 per Cent Dextrose in Physiologic Solution of Sodium Chloride.*—All the sick surgical patients in this series retained water and gained weight, one of them, patient 3, developing definite edema of the lower part of the back and ankles. The first five of them had diseases of the gastro-intestinal tract and presented various degrees of undernutrition. No clear correlation was found, however, between their serum protein and the retention of water. The critical level for total serum protein at which edema begins to develop is given by Moore and Van Slyke[10] as 5.5 ± 0.3 Gm. per hundred cubic centimeters; for serum albumin, 2.5 ± 0.2 Gm. per hundred cubic centimeters. In relation to edema the serum albumin is considered to be more significant than the total serum protein. None of the patients of this first group had serum albumin values down to the critical level, this probably accounting for the lack of correlation between this value and the retention of water, as found by other observers.[11]

To substantiate our impression that the general condition of being sick had a great deal to do with the water retention when salt solution was given, the group of surgical patients whose general condition was excellent was included here. Patient 6 retained water and gained weight when given the 5 per cent dextrose in physiologic solution of sodium chloride during the period of his acute infection. Three weeks later, when the drained area was healed, no water was retained under otherwise the same circumstances. Patients 7, 9 and 10 were convalescing uneventfully from major operations and to all intents and purposes could be regarded as healthy. Patient 8 was being treated for a chronic peripheral vascular deficiency, but his general condition was excellent. None of these four patients retained water when given 5 per cent dextrose in physiologic solution of sodium chloride for two or three days. Salt solution did not disturb their water exchange.

The water balance of the sick patients receiving 5 per cent dextrose in physiologic solution of sodium chloride was not satisfactory. Water was retained when it was not needed. On the basis of the beginning plasma carbon dioxide combining power and chloride values there was no indication for giving the saline solution to them. Per se there was no evidence that the water retention produced did any harm to the patients studied, but the common observation of water-logged tissues of surgical patients coming to autopsy may well be the result of such indiscriminate use of physiologic solution of sodium chloride. In our subjects the kidneys, at least, were called on for the additional work of excreting many grams of excess sodium chloride.

The data from this first group corroborated our opinion from clinical observations that when edema develops in sick surgical patients receiving intravenous fluids it can be stopped in the majority of instances by stopping the administration of sodium chloride. There is no need for the limitation of fluid intake or the use of diuretics. The importance of simply eliminating the



Demonstration in case 3, postoperative gastro-enterostomy, of the production of edema with the administration of 5 per cent dextrose in a saline solution intravenously, and the subsequent disappearance of the edema when the sodium chloride was omitted.

salt element was well shown in patients 3, 4 and 5, who, when the change was made to approximately 3,500 cc. daily of 5 per cent dextrose in distilled water, promptly gave up their retained water and lost weight. This was so dramatic for patient 3 as to be worthy of graphic representation in the chart.

2. *Patients Receiving 5 per Cent Dextrose in Ringer's Solution.*—The second group of sick surgical patients was given from 3,000 to 3,500 cc. of 5 per cent dextrose in Ringer's solution daily. Of the seven patients so treated six retained water, two gaining more than 3 Kg. The one patient who lost weight when given Ringer's solution plus dextrose had the highest serum protein and serum albumin in the group. His response approximated that of a healthy person.

A comparison of the data from the two groups of sick patients receiving salt solution showed that there was a tendency for a little greater retention of water when physiologic solution of sodium chloride plus dextrose was given than when Ringer's solution plus dextrose was used. Several points substantiated this

10. Moore, N. S., and Van Slyke, D. D.: The Relationships Between Plasma Specific Gravity, Plasma Protein Content and Edema in Nephritis, J. Clin. Investigation **8**: 337 (April) 1930.

11. Jones and Eaton.[8] Jones, Eaton and White.[9] Moore and Van Slyke.[10]

impression in spite of the fact that the effects of various factors predisposing to edema were probably not exactly equal in the two groups. In general, the amount of water retained was somewhat greater for the group of patients receiving physiologic solution of sodium chloride plus dextrose. Then patients 13 and 15 gained a little more weight when the intravenous fluid was changed from Ringer's solution plus dextrose to physiologic solution of sodium chloride plus dextrose. Patient 13 also had the lowest serum protein and serum albumin in the series, the values shown being well within the critical level at which edema tends to develop; yet with 5 per cent dextrose in Ringer's solution for three days the weight gain was only 100 Gm. From the standpoint of water exchange there is apparently some advantage in the use of Ringer's solution over that of physiologic solution of sodium chloride, but it is well to point out again that six of the seven patients to whom the Ringer's solution was given retained water. Its use does not obviate the occurrence of edema.

Concerning the blood chemistry, the adjustments of plasma carbon dioxide combining power and chlorides were entirely satisfactory with the Ringer's solution.

3. *Patients Receiving 5 per Cent Dextrose in Water.*—The four sick patients of this group did not retain water. For each of them a decrease in weight occurred as a result of the oxidation of body glycogen, fat and protein for energy, both these materials and the water normally held by them being lost. The water exchange was the same as if no food had been eaten and the dextrose solution had been taken by mouth.

Patient 18 was particularly interesting in that, although the serum protein and serum albumin were down to the critical level for the development of edema, no water was retained in spite of a good intake of fluids intravenously for six days.

That there need be no concern for the sodium chloride content of body fluids if salt is not being lost through abnormal channels and only water and dextrose is given intravenously was shown by the plasma carbon dioxide combining power and chloride values for patients 18 and 21 being practically the same at the end of the period of study as at the beginning. The chemical economy of the body under such circumstances was apparent when the excretion of chlorides in the urine was reduced to less than a gram daily.

SUMMARY

In many conditions associated with disease, the parenteral administration of fluids has proved to be of great value. While some difference of opinion exists as to the choice of fluids to be given, the proposition is that of supplying as nearly as possible what the patient needs. Water is generally of first importance and, since all patients unable to take water by mouth are also short on food, some dextrose is needed. Whether this is administered in distilled water or in a saline solution is the important point.

From the observations of a number of investigators, the value of saline solutions for patients who have lost sodium chloride has been well established. A distinct tendency exists, however, for the use of these solutions as a routine for all parenteral fluid administrations, without regard to whether sodium chloride is needed or not. Warnings have been given concerning the development of edema with such a procedure. From our experience and that of others the occurrence of edema in surgical patients receiving parenteral fluids is not uncommon. Many factors such as undernutrition, the excessive administration of water and salt, and the general effects of sepsis have been presented as setting the background for the retention of water. These factors are commonly found in the sick surgical patient and it has been our impression that, while they are important, the precipitating factor is generally the excessive use of sodium chloride. To corroborate this opinion a study was made of the water exchange of a group of sick surgical patients, who were given the commonly used intravenous fluids as a part of their necessary postoperative care.

It was found that twelve of the thirteen sick surgical patients receiving 5 per cent dextrose in physiologic solution of sodium chloride or Ringer's solution retained water and gained weight. The amount of water held was a little less with Ringer's solution than with the physiologic solution of sodium chloride. When administration of the salt solution was stopped and fluids were taken by mouth or changed to 5 per cent dextrose in distilled water intravenously, all of the group promptly lost the water previously retained. This last point is worthy of special emphasis. It was not necessary to stop the administration of intravenous fluids to get rid of the water retention or to use diuretics; when the sodium chloride was omitted, the edema fluid disappeared even with a good water intake.

No water was retained by a group of sick surgical patients given 5 per cent dextrose in distilled water, their daily exchange being approximately the same as if the solution had been taken by mouth. A loss of weight occurred, but this could be accounted for by the loss of body tissue oxidized for energy. One in the series, patient 18, had a total serum protein and serum albumin value down to the critical level at which edema tends to develop. From our experience, water would most surely have been held if a sodium chloride solution had been used, but with the daily administration of 3,450 cc. of 5 per cent dextrose in water for six days no retention occurred. Throughout the whole study the suitability of this solution for maintaining a normal water exchange was apparent.

Warnings about the production of edema with salt solutions are well founded and should be heeded. While actual edema was noted in only one of our patients, several of them were well on the way to developing it and would have done so if the salt had not been stopped. The only reason that gross water retention is not seen more frequently with the indiscriminate use of saline solutions is that it is generally not given for more than two or three days. The first thought of the surgeon on finding edema in a sick patient who has been receiving fluids parenterally should be "How much salt solution has been given?" Often little is required to cause water retention. We have seen several instances in which a liter a day for a week or so to a seriously ill patient was enough to produce edema of the lower part of the back and the ankles. When parenteral fluids are necessary, the thoughtful physician will avoid these errors by supplying the amount and kind of materials needed.

CONCLUSIONS

1. Retention of water is a frequent occurrence when saline solutions are given intravenously to sick surgical patients. Edema from this cause is not uncommon if the solutions are given for more than a few days.

2. Five per cent dextrose in distilled water intravenously provides for a normal water exchange.

ABSTRACT OF DISCUSSION

DR. THOMAS G. ORR, Kansas City, Mo.: It is refreshing in this age of physiologic and biochemical surgery to hear a practical paper that is not operative. Unquestionably many lives have been saved by the recognition and proper treatment of patients suffering from dehydration, chemical imbalance and metabolic imbalance. The authors have shown how one can estimate the water needs of the patient. I was especially impressed by their figures estimating the needs of the patient in the first twenty-four hours. The ordinary daily intake plus 6 per cent of the body weight is an excellent working basis, easily estimated in any particular case. This is a practical means of treating patients who come in with very definite dehydration, which can be easily determined by the general clinical appearance of the patients and by blood chemistry. Hypertonic solutions have been too much in vogue among many surgeons in recent years. Hypertonic solutions have a definite use but it is rather limited. The indications are not many. For a patient coming in with a marked hypochloremia after persistent vomiting, a hypertonic salt solution, perhaps only one dose, is indicated, but certainly that should not be overdone. The same applies to dextrose. I find that in certain places they are giving 50 per cent dextrose with the idea of feeding the patient. It is my impression that they are dehydrating him. This should not be done except in certain injuries to the brain. The authors have spoken of other dangers, notably those to the heart and the kidney, and of edema. Certainly that should be taken very much to heart. An overdose of sodium chloride will unquestionably produce edema and injure the circulatory apparatus. All therapeutic methods are overdone when first introduced, until the proper evaluation has become established. Another danger is that of embolism and thrombosis following prolonged intravenous administration. Such an important treatment as intravenous therapy cannot be discontinued because there may be an occasional accident of that type, but it is well to keep it in mind. Nature never intended that we should be fed and watered by the vein. Patients should not be treated by this method any longer than is absolutely necessary. The way to give food and drink is by mouth, and that should be controlled so far as possible. Every surgeon should study this paper carefully, for by such study he will become a better surgeon and will save more lives.

DR. WALTER G. MADDOCK, Ann Arbor, Mich.: The authors have shown that approximately 3,500 cc. of fluid is needed daily by the sick patient to provide water for vaporization and a good urine output. If abnormal losses of fluid due to vomiting take place, the 3,500 cc. amount is not sufficient. There are several causes of anuria, but dehydration, often resulting from abnormal losses of fluid, is the most common one and can be readily detected by a check-up and the finding of a negative water balance for several days previous to the insufficient urine output. In dealing with the dehydrated patient an extra amount must be given to restore the fluid previously lost, besides providing water for vaporization and urine. A study of dehydrated subjects showed that the common signs of this condition are readily recognizable when the body has lost an amount of fluid equal to about 6 per cent of the body weight. This figure can be used in calculating the additional amount of water to be given to a dehydrated patient. The total water calculation for such a patient weighing 60 Kg. would then be for vaporization 2,000 cc., for urine 1,500 cc., to relieve the dehydration (6 per cent of 60 Kg.) 3,600 cc. = a total of 7,100 cc. Studies of several dehydrated patients have shown that such volumes are first necessary to provide for a good urinary output. The authors have presented evidence to show that retention of water is of common occurrence if saline solutions are given indiscriminately to sick surgical patients. That such solutions are not generally needed was shown when an analysis of the reasons for giving fluids intravenously to 100 general surgical patients showed that only 20 per cent of them had lost appreciable amounts of sodium chloride, chiefly by vomiting, and needed some salt. The remaining 80 per cent had not lost sodium chloride but, because of their disease or because of the treatment, could not or were not permitted to take in sufficient fluids by mouth to maintain a normal water exchange. What they required was sufficient water to provide for vaporization and a good urinary output, and enough dextrose to prevent ketosis. This can be well supplied by 5 per cent dextrose in water. The whole subject of water balance forms an important part of preoperative and postoperative care. Its skilful handling, with due consideration to both the amount and the kind of fluid, will yield very gratifying results.

THE CONSERVATIVE TREATMENT OF ABORTION

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The better method of treatment of abortion is still a controversial question. This lack of accord contributes its share to the one third of all obstetric deaths resulting from abortion. In the obstetric service from 1933 through 1935, since the majority of deaths followed infection from criminal abortion, it was apparent that criminal induction bore a definite relationship to the death rate. Criminal abortion is definitely on the increase, for criminal induction was admitted in 17 per cent of the 707 cases studied. It is safe to assume that an additional 10 per cent may be added conservatively (table 1).

TABLE 1.—*Analysis of Methods of Criminal Abortion, 1933-1935*

Spontaneous		590, or 83%
Induced		117, or 17%
Total		707
Medical		26
Instrumentation		91
Doctor	29	
Catheter	10	
Pack	5	
Dilation and curettage	4	
Instrument	10	
Self	56	
Catheter	23	
Pack	3	
Instrument	30	
Midwife	6	
Catheter	4	
Pack	2	
Total		117

Self instrumentation superseded those abortions induced by physicians. Use of the catheter and instrumentation were the most common methods employed and were done mainly by white patients. Self instrumentation demonstrates that the seriousness of this procedure is not generally appreciated. It is apparent that the Negro is ignorant of the possibilities of doing away with unwanted pregnancies, but future enlightenment will increase the number of abortions tenfold. Because of criminal induction, the death rate was twice as great for the white, even though the Negroes outnumbered the white patients.

Criminal induction was the most determined cause of two thirds of the total number of deaths in which two thirds of these resulted from infection. It is evident that the major barrier was the control of infection.

Experience demonstrates that a definite history of criminal invasion of the uterus was not often obtained until after many days of hospitalization. The unreliability as to whether criminal invasion had been done with the certainty of infection, plus the large number

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of patients admitting criminal induction, made it imperative that all measures to prevent any possible dissemination should be carried out by nonintervention.

The classification of abortions is self explanatory. The discrimination between febrile and afebrile abortions deserves discussion. The presence of fever does not necessarily indicate whether virulent organisms have been introduced and if so to what extent the infection has spread. Febrile cases may result from the absorption of degenerative fetal products, while in afebrile cases there may be virulent organisms harbored in the uterus. Elevation of temperature on admission was found to be the best guide as to the presence of infection. Its presence does not have any bearing on our conservative management, but it should be used advantageously by those who actively invade the uterus as a routine.

TABLE 2.—*Classification of Abortions*

1. Spontaneous. Onset without apparent cause
2. Induced. History of abortifacient or instrumentation
3. Complete. Definite history of pregnancy with passage of products of conception. No evidence of uterine activity or bleeding
4. Incomplete. Definite history of pregnancy with passage of some part of the products of conception. Evidence of uterine activity and bleeding
5. Febrile. Elevation of temperature on admission with or without active signs of infection
6. Afebrile. No elevation of temperature or active signs of infection on admission
7. The presence of fever on admission, rather than later, as a guide seems more logical for classification, particularly for those who invade the uterus as a routine
8. Late septic. History of abortion with considerable lapse of time before admission to the hospital. Evidence of blood loss or the presence of extra-uterine infection such as parametritis, thrombophlebitis, peritonitis and bacteremia

The question of race, antepartum attention, parity and duration of pregnancy had no effect on the response to therapy. There were many more nonclinic patients than clinic ones. Abortion was more common in the multipara. The duration of pregnancy was equally divided. Syphilis played a small part as an etiologic factor in second trimester abortions. Anemia was present in a considerable number of cases but probably had no bearing. It is even questionable whether or not the anemia resulted from the abortion or was present prior to the pregnancy (table 3).

TABLE 3.—*Statistics of Deliveries and Abortions at John Gaston Memorial Hospital*

1. Total number of deliveries (1933-1935)		6,691
2. Total number of abortions (1933-1935)		707
3. Ratio: 9½ to 1		
Total		7,398
Analysis of 707 Abortions in Relation to	**Number**	**Per Cent**
Race		
White	254	36
Colored	453	64
Clinic	129	18
Nonclinic	578	82
Parity		
Primipara	185	26
Multipara	522	74
Duration of pregnancy		
First trimester	407	58
Second trimester	300	42
Wassermann reaction		
Positive	142	20
Negative	427	60
Not reported	138	20
Anemias less 3,500,000		
Positive	215	31
Negative	425	60
Not reported	67	9

A considerable number of patients had completely aborted with cessation of uterine cramps and bleeding before admission and required no treatment. A still greater number of abortions had completely separated the products of conception from the uterus and presented only the slightest evidence of uterine activity with slight bleeding. A very small number presented evidence of partial separation of the products of conception with continued bleeding.

It was observed that the simple retention of the separated products of conception in the lower uterine segment rarely caused any moderate and never profuse hemorrhage. The administration of oxytocics almost invariably brought about the expulsion of such products. It is true that the experienced operator may possibly remove such products from the lower uterine segment with little or no harm, but the teaching of interns has demonstrated to us that, unless close supervision of this procedure was carried out, more often complete exploration of the uterus was done.

Therefore it follows that, since many of the abortions are completed and require no treatment and that even a greater number of incomplete abortions responded to oxytocics, the routine invasion of the uterus was not only unnecessary but inadvisable and was never done until oxytocics had failed.

TABLE 4.—*Treatment*

1. Preparation of vulva. Vaginal speculum was introduced only in cases of moderate or profuse hemorrhage. The lower uterine segment was not invaded. Tissue protruding through cervix was removed with sponge stick
2. Blood transfusion was given immediately on admission for massive blood loss. It was used rather frequently in others to maintain resistance against infection
3. Elevation of the head of the bed to promote drainage
4. Icebag to lower part of abdomen to promote contractility of uterus
5. Fluidextract of ergot, 30 minims (2 cc.) every four hours for the complete type
6. Solution of posterior pituitary, from 0.5 to 1 cc. every four hours, for incomplete type with slight bleeding. Fluidextract of ergot, 30 minims (2 cc.) every four hours after passage of products of conception
7. Solution of posterior pituitary, 1 cc. every hour, for moderate or profuse bleeding, for incomplete type until products of conception have passed, followed by fluidextract of ergot 30 minims (2 cc.) every four hours, for four days
8. Invasion of the uterus rarely necessary, done only following the failure of oxytocics
9. In a small number of cases continued bleeding necessitated the use of sponge stick, curet or pack

Continued bleeding after the cessation of uterine cramps indicated that some of the products of conception had not been expelled. A small fragment of placental tissue adherent to the uterine wall was encountered in a small group of cases. Oxytocics proved of little value. Operative intervention was indicated. A study of such cases with their sporadic occurrences signified that overenthusiasm rather than actual clinical and blood signs was often responsible for active invasion of the uterus. In a small group of cases of continued bleeding, active invasion failed to reveal the presence of placental tissue. This suggested that infection of the uterus wall was responsible for the bleeding. Violent manipulation and sharp instrumentation was never used for fear of perforation. A sponge stick or dull curet was used for exploration in such cases.

It was thought that second trimester abortions would give considerable trouble when the conservative plan of management was introduced as a routine. However, end results indicate that this belief was based on a false premise, for in only two such cases was operative intervention necessary. We adopted this conservative type of treatment in this group of cases based on our

experience with the handling of retained or adherent placenta complicating full time labors. Experience demonstrated that in the majority of cases the placenta was almost invariably expelled without active invasion of the uterus. The good results of this procedure in full term labors was again substantiated in the management of second trimester abortions.

It did not matter whether the uterus was emptied, when once infection had extended beyond the uterus. It was generally accepted that no active intra-uterine manipulation should be carried out but that all efforts should be directed toward building up the patient's general resistance. The deaths in this series indicated that almost a fatalistic attitude must be assumed; for, with the exception of an occasional case of blood stream or parametrial infection, practically all patients died. The active treatment to combat thrombophlebitis and general peritonitis seemed almost hopeless. Sufficient evidence gained elsewhere indicated that ligation in thrombophlebitis and drainage in peritonitis were practically of no value.

There is no doubt that the postponement of medical care, too late to establish localization, was found to be more dangerous than the presence of infection. The

TABLE 5.—*Analysis of Operations, 1933-1935*

Complete abortion	189, or 27%
Incomplete	518, or 73%
Febrile abortion	161, or 23%
Afebrile abortion	546, or 77%
Total	707

Incomplete Abortions	Number	D. & C.	Pack	Manual Removal	Bag	Total
1933	159	4	0	1	0	5
1934	178	3	1	0	0	4
1935	181	2	4	2	1	9
		9	5	3	1	18

18 operations performed in 518 incomplete abortions, or 3.5%

necessity of immediate conservative treatment with its good results was substantiated in contrast to the eight of the nine patients who died presenting evidence of extra-uterine infection on admission to the hospital.

One hundred and eighty-nine of the abortions were completed and 518 were incomplete prior to admission. One hundred and sixty-one of the total number of abortions were febrile, while 545 were afebrile. The incidence of operation was comparatively small, for only eighteen operations were performed in the 518 incomplete abortions. Dilation and curettage accounted for 50 per cent of all operations and were done for prolonged bleeding following the failure of oxytocics. Uterine packing was occasionally employed and only after instrumentation had failed to reveal retained tissue. Manual removal used only in three cases demonstrated that immature placenta caused very little trouble (table 5).

Morbidity and hospitalization were considered by many to be an indication for routine emptying of the uterus. The average number of days for morbidity of the entire group of cases was two and eleven twelfths. The morbidity was slightly larger in febrile cases. The average number of hours necessary for oxytocics to empty the uterus was twelve and one half. The average number of hospital days for all cases was seven.

The seriousness of the abortion problem submerges the question of morbidity and hospitalization and demands a plan of treatment that results in the smallest number of deaths.

An immediate inventory of the patient's general condition was as important as the information whether or not the uterus was emptied. Immediate blood transfusion saved many patients from almost complete exsanguination, while in others it fortified body resistance sufficient to overcome infection.

Transfusions were performed 148 times in 707 cases. The number of transfusions was certainly not out of

TABLE 6.—*Comparative Analysis*

End Results in Relation to	No. 124 Complete Afebrile	No. 65 Complete Febrile	No. 422 Incomplete Afebrile	No. 96 Incomplete Febrile	Total 707
Spontaneous	102	40	373	74	590
Induced	22	25	49	22	117
Average days in hospital	6	8	7	6	7
Average days morbidity	1	3½	⅔	4½	2 11/12
Treatment					
Conservative	124	65	409	91	689
Operative	0	0	13	5	18
Average hours for uterus to empty	0	0	13	18	12½
Transfusions	18	16	80	34	148
Results					
Lived	123	63	421	91	698
Died	1	2	1	5	9

proportion; for only 148 were given to 215 patients who had less than 3,500,000 red blood cells (tables 3 and 6).

The analysis of deaths reflected that the method of treatment of emptying the uterus played no part. The three patients who died within the first twenty-four hours were immediately dismissed from the discussion. The second group of so-called late septic abortions were likewise completed and had no bearing on active invasion or conservatism. All these patients presented extra-uterine extension of infection.

There remains only three cases for discussion that would actually come within the realm of this subject.

TABLE 7.—*Analysis of Deaths, 1933-1935*

1. Cases not associated with hospitalization 3
   - (*a*) Postabortal, complete; estivo-autumnal; death in two hours
   - (*b*) Postabortal, complete; criminal; three weeks; exsanguinated; died five hours after admission
   - (*c*) Postabortal, complete; criminal; general peritonitis; died in sixteen hours after admission
2. Late septic cases from 3 to 8 weeks after abortion 3
   - (*a*) Complete; criminal; three weeks; died of peritonitis on fifteenth day
   - (*b*) Complete; criminal; three weeks; pelvic thrombophlebitis; positive blood culture, nonhemolytic streptococcus; autopsy, pyemia, lung abscess; died fourteenth day
   - (*c*) Complete; spontaneous; eight weeks; thrombophlebitis; continued bleeding; dilation and curettage; died fourteenth week; questionable surgical judgment
3. Cases admitted within five days after induction 3
   - (*a*) Incomplete abortion; criminal; two days; conservative treatment; uterus emptied in ten hours; died of peritonitis, ninth day
   - (*b*) Complete; criminal; four days; blood cultures, anaerobic streptococcus; died of peritonitis on fourth day; admitted with peritonitis
   - (*c*) Complete; criminal; four days; exsanguinated; admitted with peritonitis; died tenth day

One of these cases was admitted four days after complete abortion. Death occurred from peritonitis on the fourth day of hospitalization. A second patient was admitted exsanguinated four days after complete abortion and had a transfusion but died from peritonitis on the tenth day. The third case was an incomplete abortion. The uterus was emptied by oxytocics within ten hours. The patient died from peritonitis on the ninth day.

In the final analysis, it is apparent that only one of the deaths could be associated with the question of intervention or nonintervention, for the remaining cases were admitted with no evidence of retention of the products of conception.

It seems that the major problem, at least in this group of cases, is not a question of intervention or nonintervention. It is felt that delayed hospitalization for immediate effective therapy was the factor that must be emphasized because of the low death rate associated with early treatment of abortion. Just what can be done about this delay is hard to state. Economic distress and the attempt to shield the presence of an unwanted pregnancy as a reason for delayed hospitalization will always remain the same problem.

CONCLUSIONS

Deaths resulting from abortions constitute the large proportion of the total maternal mortality. The number of criminal abortions is increasing. It is imperative that more conservative treatment be employed for controlling hemorrhage and for combating infection. Under the plan of nonintervention, which has been in use for three years, invasion of the uterus was rarely necessary for control of hemorrhage and was never used to combat infection. Blood transfusions proved their value for checking infection and for restoring blood volume. Records of a series of cases emphasized the infrequent need for operative intervention and the low mortality. The seriousness of the abortion problem submerged the question of morbidity and days of hospitalization. It is believed that conservative treatment should be more universally employed in an effort to reduce the number of deaths from abortion.

TABLE 8.—*Summary of Results of 707 Abortions, 1933-1935*

Complete abortion	189
Incomplete abortion	518
Conservative treatment	689
Operation performed	18
Average days in hospital morbidity	2 11/12
Average days of hospitalization	7
Deaths in series	9
Deaths not associated with hospitalization	3
Deaths in admissions 3 to 8 weeks after abortion but not associated with therapy	3
Deaths in admissions within 5 days with peritonitis	2
Deaths associated with conservative treatment	1

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ABSTRACT OF DISCUSSION

DR. J. C. LITZENBERG, Minneapolis: I was impressed with the fact that the authors could give such a remarkable report from a community, largely colored, where hygienic surroundings are poor. My mind reverted back twenty-nine years when a commission appointed by the American Medical Association to investigate the treatment of puerperal sepsis (including septic abortion) reported its recommendations, among which was the condemnation of all such cases. The recommendation of active treatment illustrates how long it takes to instil into the medical profession principles which have been established by experts. That was twenty-nine years ago this month, and yet there are few hospitals that can give the statistics that the authors have revealed today. They reported only one death, and intervention was almost eliminated. Criminal abortions are greatly on the increase. Thousands of mothers are losing their lives through improper treatment of septic abortion. Dr. Fred Taussig states that there are performed at least 700,000 cases of criminal abortion annually in this country. The birth rate is decreasing alarmingly. Therefore it is up to us as a profession to save all the conceptions that do occur so that we may maintain our population. It may astonish some to know that we have already reached in the United States a birth rate which is barely capable of maintaining our population. When our population begins to decrease, perhaps we shall be awakened to the fact that a decreasing population means a degenerating civilization. That is what happened to Rome and Carthage. Perhaps we cannot do much about lessening the number of criminal abortions, perhaps we cannot do much about increasing conceptions, but we as a profession can do a great deal by conserving all the conceptions possible that do occur and by conservative handling save for future child bearing these mothers who are threatened by death on account of septic abortions. It is rather discouraging to hear the authors speak about those who intervene. Twenty-nine years ago the commission deprecated such intervention, well supported by statistics and by a long-time investigation, and yet we all know that intervention by curettage is the method of treatment in too many hospitals. The paper of Drs. Reinberger and Russell puts a new emphasis on the necessity of conservative treatment of abortions.

DR. THOMAS K. BROWN, St. Louis: In a series of 500 consecutive abortions treated at St. Louis City Hospital active treatment was employed. The therapeutic principle involved is drainage of a wound site which is found to be contaminated in 60 per cent of the cases. The bacteriologic studies in these cases have been helpful in showing the probable source of such contamination, the vaginal tract. Soule and I have previously reported anaerobic growth in 60 per cent of vaginal cultures on patients in the obstetric clinic. In the present series the cases with positive intra-uterine cultures, 60 per cent, showed the incidence of anaerobic organisms to be 92 per cent. As to questions of permanent damage to the pelvic organs and future sterility, both of which have frequently been observed in such cases, I wish to state that, subsequent to early active treatment, pelvic examination reveals the presence of no residual pathologic condition, and further pregnancies promptly occur if no contraceptive measures are used. No prolonged period of convalescence is noted. As to deaths occurring in the two series, one finds that in each group the patients were virtually moribund on admission, were under observation for a relatively short period, and made little or no response to any type of therapy used. The average period of hospitalization after active treatment was 6.3 days. By early active treatment, bleeding has been promptly arrested and the need for blood transfusions has been considerably reduced. By active treatment is meant gentle evacuation of the uterine cavity by means of a Forester sponge holding forceps. No curettage is done. Because of the close parallelism in the two sets of results and the absence of evidence of any real damage being done in a series of 500 cases treated by junior interns under proper supervision, it seems to offer further support to the policy of active treatment. In the final analysis what more have Drs. Reinberger and Russell accomplished than to attempt to obtain evacuation of the uterus by medical rather than by mechanical means? When failing in the former method, they resorted to the latter. In view of the similarity in results obtained in these two series, it seems logical to attempt to bring the disease process to a more abrupt termination by ending it mechanically and to avoid the period of watchful waiting during which time a localized process may become more widespread.

DR. RUDOLPH W. HOLMES, Chicago: I have had a rather unusual experience with abortions, particularly criminal. In 1898 I was appointed chairman of the Committee on Abortion of the Chicago Medical Society and thereby was accredited to the coroner's office and for five or six years was a deputy coroner. As a result of our investigations the committee concluded that for every baby born alive in Chicago, in that day about 30,000 to 32,000, one baby was destroyed by a criminal operation. Our conclusion was that criminal abortions destroyed as many fetuses as did all other causes of early interruptions of pregnancy. Our committee was responsible for more apprehensions of culprits and their convictions than had obtained for many years previously. Repeatedly, we found on postmortem examination that the uteri were perforated: at times there was strong presumptive evidence that the perforations were sequential to the secondary operation, and in others the evidences were conclusive that they were the result of the unwise and contraindicated curettages. Such intra-uterine instrumentations frequently convinced the coroner's staff that

holding the abortionist to the grand jury was futile, as any jury would be convinced as we were that the attending physician had greatly contributed to the death of the woman. In former times it was quite the vogue to curet as a routine before hysterectomy as part of the operative toilet: in my own practice and in that of Dr. Thomas Watkins, we never found more than half the uterus touched by the curet. I state this to show how futile is the attempt to curet the uterus for sepsis. Further, most have forgotton the reaction zone of Bumm, which is tantamount to making the infected uterus an abscess cavity. Who teaches the curettage of an abscess wall? Dr. Barrett is correct. In the presence of severe hemorrhage do a digital currettage but use no instruments. A well placed tampon in appropriate cases is good if there is slow bleeding. The teaching of Drs. Reinberger and Russell should be given heed: conservative methods will give better results than operations.

DR. W. T. PRIDE, Memphis, Tenn.: Dr. Barrett must have been mistaken in his interpretation of the cases when he complained about not curetting in all and the transfusions. In my service the patients in whom transfusion is done come in almost exsanguinated, they are in bad condition and it wouldn't matter whether the contents of the uterus were still there; they would need the transfusion just the same. I deal with a class of people whose circumstances are different, and when you say 140 transfusions it seems like a great deal, and yet with 700 patients of that type it is not a great number of transfusions. One remark was made with which I do not agree and that is the advisability of irrigating an infected uterus. I do not irrigate. Dr. Barrett brought up the question that if these nine who died had been curetted maybe they would be here, but how about all of those who wouldn't be here if they had been curetted? For the past three years I have treated all these cases conservatively and I leave to you the results.

DR. JOSEPH B. DE LEE, Chicago: I had the honor to be the chairman of the committee to which Dr. Litzenberg referred in 1905 or 1906. The committee was appointed for the study of the treatment of puerperal infection. In those days the treatment of puerperal infection was wash, curet, brush, sponge and do everything one shouldn't do. Williams was on the committee, Litzenberg and one other. We communicated with every professor of obstetrics in the United States and every assistant professor and many abroad, and we combed the literature at home and abroad, and the report the committee brought in was that the conservative treatment of puerperal infection, including abortions, was the best. There is no difference of opinion between the two sides that have been taken here this afternoon. They both agree that the uterus ought to be emptied, but how—medically or surgically? It will be noticed that the surgeons are treating infection much more conservatively than they used to, with a great deal less cutting. For septic abortion, medical treatment is what I recommend. Quinine 3 grains (0.2 Gm.) every hour for five doses, if the patient can stand quinine, followed by solution of posterior pituitary. Most of the cases will terminate themselves. If the woman has a high fever and she bleeds too much, a transfusion and a packing of the vagina are in order, after removal by gentle traction of pieces of the placenta sticking out of the cervix. There is no invasion of the uterus, packing of the vagina temporarily, trying to tide the woman over until her local and general immunities have been developed. That is the essence of the treatment that I have found the most successful. I watch the literature very closely, reading articles defending both sides of this moot question, and I believe that in world literature of today the balance is in favor of conservative treatment.

DR. LYLE G. MCNEILE, Los Angeles: Ordinarily it is not within the province of the chairman to discuss a paper, but I think that the subject merits a wider discussion. I was trained by Dr. De Lee and then I went to the Los Angeles General Hospital where the treatment of abortions was in the hands of those who called themselves gynecologists. They scraped every uterus well and faithfully. After five years I was able to remove the abortions to the obstetric department. Then the abortions came under the conservative treatment. We reduced our mortality at least 75 per cent by going from this curet method to the same general trends that Dr. De Lee has mentioned and Drs. Reinberger and Russell discussed in their paper. We have been on that regimen for the last twenty years and we are going to continue the conservative treatment, which is, I think, the same treatment in infected abortions.

DR. JAMES R. REINBERGER, Memphis, Tenn.: I prefaced the presentation of slides with the remark "the better treatment of abortion is still a controversial question." I believe that the discussion has borne out this statement. The consistent number of deaths from abortion, not only in our hospital but throughout the entire nation, suggested that some dogmatic regimen should be adopted to find out whether or not the therapy played any part in these fatalities. Owing to the fact that so many of the patients admitted criminal induction, while others came in with infection spread beyond the uterus, it was advisable to adopt the conservative method of treatment. For the past three years this plan has been in vogue. The end results in this series indicate that it has been effective. Dr. McNeile's remarks relative to the shifting from radical therapy to conservative treatment reminded me of my intern days in Bellevue Hospital, for there I saw the same evolutionary change. The same low incidence of operative intervention is again demonstrated in the series of cases just presented. I am not so sure that perhaps in a closed institution caring for only clinic cases or in private practice the uterus may not be emptied in a routine manner under the guidance of an experienced hand. But generally we feel that a plan of treatment should be universally adopted that is applicable to all men under all conditions where neither experience nor facilities are available, if the death rate is to be reduced.

MEDICOLEGAL ASPECT OF ARTIFICIAL INSEMINATION

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AND
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The science of artificial insemination has been known for many years among animal breeders who desire pure stock. Within the last few years, however, artificial insemination among human beings has attracted quite a little attention, owing to the success attending its practice.

Unfortunately, or fortunately, the physician is bound by many legal restrictions in the practice of medicine, and, however morally certain he may feel in aiding or abetting certain acts, he must live within the legal restrictions and also comply with the dictates of society, which form the moral code of the country.

The question of the legitimacy of a child born in wedlock, as a result of artificial insemination from a donor other than the father, has not been brought to trial as yet. It is with this in mind that we are presenting this paper in the hope of answering some of the many questions asked us by physicians. We will present the legal relationships of all parties, one by one, and give what suggestions we have to offer and the ways in which we handle the matter. The question will be taken up only from a legal point of view.

First, let us take up the question of the legality of the mother's position. Adultery, by the New York State law, is defined as "the physical relationship between a woman or man with a partner other than the legal mate." This interpretation automatically dispenses with any such question in a case of artificial insemination, as the prospective mother does not even know or see the donor. However, we have found it necessary and advisable to insist that the woman's hus-

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band be made to give a written consent that his wife be inseminated. We use a specific form, as the one suggested herewith.

The signatures of both the husband and wife are affixed to the document and sworn to before a notary.

We have the wife affix her signature on the same sheet after her husband's, making a very definite statement that she too joins her husband in the request for an artificial insemination. This rules out any question that the wife did not know what was going to be done. There is one other feature that we insist on, namely, the fingerprinting of both the husband and wife—right and left thumbs—which are placed on the margin of the consent sheet, next to their respective signatures. This is done for the reason that most of our patients are referred and we have no proof that they come to us for the sole reason of the insemination. We do not know whether the man with whom the wife presents herself is the legal husband or not. Although the

CONSENT FOR ARTIFICIAL INSEMINATION

I ....., residing at ....., of my own free will and volition have requested Dr. ..... to inseminate my wife artificially with the sperm of a male selected by Dr. ..... This request has been made with the full knowledge and consent of my wife, whose authorization is hereto annexed. I am making this request because it is not possible for me to procreate and because both my wife and myself are extremely anxious to have a child and because our mutual happiness and the well being of my wife will be best served by this artificial insemination.

.....(L. S.)

On this ..... day of ....., 193...., before me came ....., to me known and known to me to be the person described herein and who acknowledged to me that he executed the foregoing consent.

.....

I, ..., join in my husband's request above stated and hereby authorize Dr. ..... to inseminate me artificially with the sperm of a male selected by Dr. .....

.....(L. S.)

On this ..... day of ....., 193...., before me came ....., to me known and known to me to be the person described herein and who acknowledged to me that she executed the foregoing consent.

.....(L. S.)

[Fingerprints of both partners.]

chances of deception are rather remote that a woman would know two sterile men in her acquaintanceship, the possibility exists. We insist on a physical examination of the man to determine his sterility independent of the history presented by the doctor who refers him. This is an added precaution, first, to make sure that the man presenting himself as the husband would not be able to have any of his own children and is actually sterile. A testicular puncture is made and the material obtained is examined microscopically. This is done in addition to the usual condom specimen obtained in diagnosing such cases. This definitely proves the man's sterility. The finger-printing of the examined man identifies him as the person presented by the woman as her husband. This establishes any misrepresentation by the woman as her guilt alone and does not implicate the physician. There might be a condition arising in which the real husband is opposed to having his wife artificially inseminated and she might use a ruse by introducing to the doctor some one willing to help her attain her wish. This makes it doubly difficult in that the man whom she would have to present would also have to be sterile.

Such a precaution in itself would defeat the majority of such situations. The consent sheet is signed in duplicate, notarized and witnessed. These consent blanks are then separated and placed respectively in the vaults of separate banks and forgotten unless a legal complication should arise. These consents legitimatize the child under our present laws and establish it as the legal heir of the family unit. It also acts as mental binder on the husband, in that he knows he can never deny having authorized the creation of his wife's child.

One may by a stretch of the imagination surmise certain hypothetical situations that might arise. Supposing for some reason, in about ten years after the birth of the child, the legal father should tire of his spouse and institute divorce proceedings. It would be very easy for him to obtain a divorce if these papers were not in existence in New York State, for all he need say to a jury would be "Gentlemen of the jury, I have been sterile for all my marital life and before marriage, and I can substantiate this statement by presenting evidence and also through the testimony of doctors who have examined me at frequent intervals." The jury certainly would believe him and would not believe what they would consider the apparently fantastic story of the wife. She would plead that her physician was dead and that he would have been able to say that her husband gave her special permission for such an arrangement. This would not be sufficient testimony to convince any jury of her sincerity, and no jury in the world under these circumstances would hesitate to grant a divorce to the husband. However, if the husband knew that these papers which he signed years ago could be subpenaed, whether the physician is dead or alive, he would not even institute proceedings. To obviate this possibility, therefore, any physician entering this field should train a younger surgeon in the work, familiarizing him as to the whereabouts of the records and making necessary provisions so that in case of his death his successor can carry on, because the legal complications that might arise may be far in the future, perhaps after the child has reached its majority, in the case of inheritance of his father's real property. On the other hand the wife, in her turn, could plead in the court that she did not know what she was doing and had believed that her husband's spermatozoa were to be used. The husband might even plead the same thing and then the doctor would be in for a pretty lawsuit, because the jury would naturally sympathize with the plaintiff. All that would be needed to prove their suit would be the testimony as to his sterility by a physician who examined the husband's secretions prior to the birth of the child.

There is little likelihood of the mother's ever bringing suit except in the event of cross-insemination when the surgeon allowed the identity of the donor to become known.

The mother's relationship to the husband is strengthened after the birth of a child obtained in this manner. Her admiration for his broadmindedness and for her personal consideration is limitless. The bitter years of disappointment of childlessness are behind her. She now has something which she desired most of all. She bends every effort to have the child please the man who is really responsible for the child's being. The mother's moral caliber must be of the very highest or she would never have reached a physician's office asking aid in her problem. The woman of low morality would have resorted to more natural means and would have prevented her husband from ever knowing of his sterility by bearing him one or more children by questionable sources.

The mother's relationship to the physician is of necessity one of utmost confidence and sympathy. The phy-

sician has already taken the precaution that the mother does not know who the donor is and she has consented to this arrangement legally in writing. Her curiosity is met with an assurance that he is exactly like her husband. This does two things: it blocks any future idle hours of conjecturing which may torture her and she concentrates, focusing her attention on the husband, where it should very properly be.

The husband, on the other hand, having been denied paternity, sublimates his feeling and raises the child even more carefully than he would his own. He realizes that the child is a eugenic baby because the doctor has spent a great deal of time in procuring the right type of donor and that if he, as the father, gives the child the proper opportunities in life there is no limit to what he can develop him into. His respect for the mother has greatly increased. In the case in which the husband is anxious for an heir, she has consented to bear him a child under unusual circumstances. Then again, when the woman insists on entering into such an arrangement, the husband still feels that she is primarily bearing a child to make up for his deficit and would not have had to resort to this measure had he been normal. So the marital relationship turns out to be greatly strengthened.

The husband's relationship to the physician is, of course, the same as his wife's.

We now come to the question of the donor, protecting him as well as all others concerned against any possibilities of blackmail. The donor is required to deliver his specimen at a different address or apartment or at a different time than the arrival of the patient. Another simple method is to keep the two hospitalized during the period. We find this much easier. It eliminates the question of possibility of blackmail by the donor. He has no possible way of knowing who the recipients are and no one can learn the identity of the donor.

If the physician should consider it preferable for any reasons of his own to transfer the sperm in his office, and should the donor by any chance enter into collusion with a third party and have both entrance and exits of the office watched, there is little danger, because of the number of patients going in and out during office hours.

There is one more legal aspect to this question, and that is the donor's relationship to his own legal wife. It is preferable that the donor be married, as it eliminates a tendency to promiscuity. However, notarized permission from the legal wife stating that her husband may participiate in this scientific venture is essential. We do not know but that such a venture on the part of a husband may be a violation of the laws against adultery. Therefore, as in New York State, if the wife is cognizant of the condition and has so signified in writing, she is unable to obtain a divorce on these grounds, as condoned adultery nullifies grounds for divorce.

It is with all these hypothetical legal entanglements well in mind that a specialist undertakes this type of work. The surgeon who does an artificial insemination should never become the obstetrician in the same case. The pregnant woman should choose another obstetrician in about the seventh month who is not familiar with the unusual circumstances of the pregnancy. He can in all good faith make out the baby's birth certificate under the direction of the parents and give that child a document irreproachable in the eyes of the law. The child is then established as the legal offspring. This may be a subterfuge, but it is a necessary one. It is a protection for the child, and the responsibility of the child is primarily the physician's. Morally the physician is bound to see that all possible unhappiness is avoided. It is easy to understand that when the child reaches adolescence, assuming that it is a normal unit in his own family, there would be great danger, if by some inadvertent remark the child should discover any irregularity in his creation. The damage to its psychologic make up would be disastrous. An inferiority complex would be set up with a root that psychoanalysis could not destroy and the child's maladjustment to society would result.

We feel very strongly that the responsibility lies with the physician not only in the creation of the child but in its future welfare, particularly in its adjustment in its own family unit.

Another phase to the question arises when the sterile husband asks to have a relative be the donor. This should never be consented to. The usual request by the husband is that one of his brothers act as the donor because he is sure that the child would look like him. Genetically, of course, this need not be true. Psychologically this would be unsound, for if the mother should know who the actual father of her child was there would be danger of the transference of her affections to the brother, especially as he resembles her husband, particularly if he is single. If, on the other hand, he has a wife and child of his own, there would be the danger of breaking up two families if the feeling should be reciprocated. This is usually followed by a suggestion that the brother be used without the knowledge of his wife. However, as the brother or near relative may succumb to the human failing and tell her at a later date, causing extreme mental shock, this also is unwise. Furthermore, if he should be married, the brother could not be used without the permission of his wife, and this would entail many people knowing the situation, all except the wife. Legally, the brother's wife would have a case against both the doctor and her own husband, if she were not told and later discovered the fact. Under these circumstances, with so many knowing, the child would eventually be told. The husband then might naively suggest that his brother be brought to the office under some pretext and a specimen obtained which could be used on his wife, the idea being that the brother would not know anything about it. This, of course, is absolutely impossible for a physician to do under any circumstances, it being dishonest as well as unethical. Such a suggestion should be immediately refused, and the idea of stealing impressed on them, because we regard this worse than ordinary thieving. If such a case should ever arise, punishment to a doctor participating in such a crime should be meted out in full. Further, a relative should never be used as a donor, even with his permission, because at a subsequent date he might become so attached to the child that he would sue for custody of the child; and a jury would be inclined to favor him.

There have been recent cases in the New York courts in which an effort has been made to prove the paternity of the child through the determination of peculiarities of hereditary characteristics shown by blood grouping. This should also be considered in selecting a donor, choosing one whose blood group corresponds with that of the husband.

It would be well to bear in mind that a child born in wedlock is the legal heir unless his paternity is disproved and a "final adjudication is handed down by a court." Unfortunately the father in these cases does not wish to go through the formal legal adoption pro-

ceedings (although this would be a safeguard for the child to inherit his real property), for it would publicize the one thing he desires to conceal; namely, the cross-insemination of his wife. If the man feels uncertain that the child may be blocked from inheriting such real property as he wishes to leave it, as for instance in a case in which a wife, wishing to inherit all the money or control it, might seek to disprove the child as her demised husband's legal heir, he can draw a will stating that if any action is taken by any beneficiary the one so doing forfeits his or her share under the will. To make it even stronger, he can insert a clause canceling any bequest to the wife should she marry within one year and a day from the date of filing the will for probate. Then the child's legality is protected, as time for any legal action will have expired.

These are some of the many considerations of artificial insemination from the medicolegal point of view. Some suggestions are given to aid in avoiding some of the complications that may arise and so to prevent them from casting a shadow of unhappiness over the child we have helped create, whose sole excuse for being is to bring happiness to an otherwise unhappy marriage.

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THE PRESENT STATUS OF CYSTOMETRY

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Cystometry [1] embraces more than bladder pressure, more than vesical volume pressure. It is a sensory, vesical volume pressure with sphincter control diagnostic procedure. As the bladder immediately accommodates itself to incoming fluid, it is necessary to use a two-way catheter to provide a fluid intake as well as a recording compartment for the instantaneous return pressure to obtain a complete graph in the process of filling. This means, as nearly as possible, an uninterrupted tracing of muscle contraction and relaxation of the bladder wall on which line sphincteric reactions, sensations of temperature, the first desire to void, and degrees of overdistention can be noted. The relationship of volume pressure to sensation and sphincter control is often abnormal and is of more value in cystometric diagnosis than any one factor alone.

The clinical value of this procedure lies chiefly in its identifying the bladder to clinicians as an organ of practical physiologic importance in differentiating all types of neurogenic from physically obstructed bladders, so that treatment may have a better foundation, and in offering bladder function tracings to explain symptoms and determine the results of treatment in dysuric bladders. Clinically, in my experience, it quite alters the usually accepted view of bladder importance in prostate and bladder surgery, particularly in relation to infection. It differentiates types of dysuria after surgery, childbirth, trauma and disease or injury of the brain or spinal cord.

For experimental work undoubtedly a continuous graph is necessary,[2] but for clinical or bedside work methods of interrupted readings, that is, introducing 50 cc. and then taking a reading, are satisfactory. It was the method used in the first cystometric work,[1] and the general ideas were verified and simplified by Muschat [3] in developing his cystometer. With such methods, however, the fine oscillations in pressure cannot be obtained, and in oscillations of wider excursion it is impossible either to take the reading exactly at 50 cc., for example, or to determine the type of oscillation as in cystometrograms in pyelitis of pregnancy [2] or in the spina bifida work of Langworthy and Dees.[4]

Further, as a most important adjunct in the efficacy of the procedure, it was soon noted that obtaining a second tracing at each examination was absolutely necessary, not to verify the first but to note on the second curve the influence of the first filling. In general the normal or irritable bladder is stimulated to decreased capacity and increased pressure, while the low sensation type of neurogenic bladder shows diminished sensation with increased capacity after the distention of the first filling.

Flat or low pressure often noted in the first graph was thought to be due to breaking down or decompensation of the bladder wall, but I now attribute such readings, particularly in the first curve, to inhibition as well as to decompensation. That it was due to inhibition in some instances was first pointed out by Denny-Brown and Robertson [5] and later verified by Parker and Rose.[6] It is now accepted in our clinic that, in the majority, initial low pressure tracings in the first two readings show that the case is of the non-neurogenic type, although occasionally they show bladder wall decompensation; usually inhibitions are psychic from fear or reflex from instrumentation.[6] The differential diagnosis can be made only by doing at least two fillings in the first cystometric examination.

Lewis, Langworthy and Dees [7] point out that injury to the motor pathways renders the consequent frequent small amplitude waves of bladder contraction "ineffective in emptying the bladder." The stretch reflex of the muscle of the bladder wall, they point out, is hyperactive "with release of cortical control." Muschat [8] places the sensation of a first desire to void above 250 cc. in the hypotonic and under 150 cc. in the hypertonic bladder. I believe that correlation of points such as these, together with observation of the behavior of

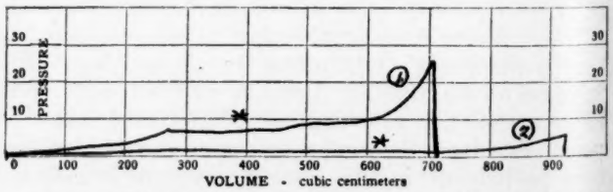

Chart 1.—Typical cystometrogram showing delayed sensations and the effects of the first filling in an anesthetic, low pressure bladder in that the second curve shows greater capacity, diminished sensations and lower pressure than the first curve. In other words, the first filling breaks down the resistance of the bladder wall, which secondarily influences the sensations. The asterisk in these charts indicates the first desire to void.

From the Washington University School of Medicine and Barnes Hospital.
Read before the Section on Urology at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 13, 1936.

1. Rose, D. K.: Determination of Bladder Pressure with the Cystometer: A New Principle in Diagnosis, J. A. M. A. **88:** 151-156 (Jan. 15) 1927.
2. Rose, D. K., and Rollins, P. R.: Pyelonephritis in Pregnancy, J. A. M. A. **96:** 235-240 (Jan. 24) 1931.
3. Muschat, Maurice: The Value of Cystometry, J. Urol. **33:** 366-383 (April) 1935.
4. Langworthy, O. R., and Dees, J. E.: A Study of Bladder Disturbances in Spina Bifida, J. Urol. **35:** 213-226 (Feb.) 1936.
5. Denny-Brown, D., and Robertson, E. G.: The State of the Bladder and Its Sphincters in Complete Transverse Lesion of the Spinal Cord and Cauda Equina, Brain **56:** 397 (Dec.) 1933.
6. Parker, M. M., and Rose, D. K.: Bladder Inhibition, Arch. Surg., to be published.
7. Lewis, L. G.; Langworthy, O. R., and Dees, J. D.: Bladder Abnormalities Due to Injury of the Motor Pathways in the Nervous System, J. A. M. A. **105:** 2126-2132 (Dec. 28) 1935.
8. Muschat, Maurice: Simplified Interpretation of Cystometrograms: The Three Factor Principle, J. Urol. **34:** 340-343 (Oct.) 1935.

the sphincters in their cystometric interpretation, will be enhanced by taking two readings instead of one.

The two types of imperfect sphincter control causing incontinence to be noted are whether the fluid is expelled as a voiding or whether it slowly leaks out around the catheter. The position of the catheter in its relation to the body points definitely to the status of the voluntary sphincter.[9] If it approximates a 90

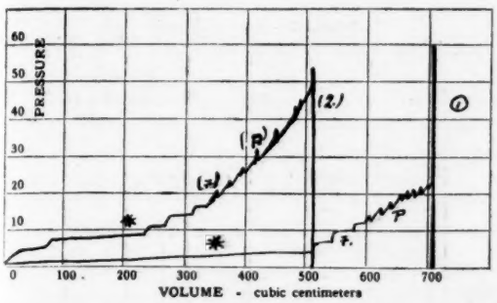

Chart 2.—The patient had 900 cc. of uninfected residual urine removed just previous to the taking of the cystometrogram. Retention was secondary to prostatic hypertrophy. A hypertrophic wall is demonstrated by the steplike ascent after the sensation of fulness (*F*). The relationship of manner of rise of pressure to 520 cc. in curve 1 and to 220 cc. in curve 2 suggests inhibition in 1. The decompensation is physiologic; that is, back pressure anesthesia or adaptation, with an anatomically thickened bladder wall. In such a bladder I have come to expect about this degree of reaction to the first filling. These deductions would be impossible from a single cystometric curve.

degree angle with the body there is spasm or an increased sphincter resistance. If it parallels or drops below the plane of the body, it shows a diminished resistance. This mobility of the posterior urethra is an important factor in sphincter control. It is essentially a disalinement of the internal and external sphincter openings[9] and occurs in both males and females. It is less forceful in the latter.

The main subdivisions of cystometric interpretation are myogenic and neurogenic and their interrelationship. When an altered reaction, primary in the musculature, is secondary to scar, infection, overwork, obstruction or trauma, it is considered myogenic. When the changes are primary in the nervous system with consequent alteration in the function of the wall of the bladder, it is considered neurogenic. In these instances the neurogenic changes may be of the wall itself or of the sphincters, considered the "bladder lock" by Muschat.[3] In this regard it is to be hoped that the sphincterometer developed by Simons[10] will be of help. The neurogenic changes may be either an increase or a decrease of irritability and tone of either the bladder wall or its sphincters. They may be either directly central or peripheral or entirely reflex.

Any increased resistance by the outlet causes a hypertrophy of the bladder wall to a point sufficient to overcome the obstruction. This process is gradual and its degree can be interpreted by the cystometrogram. Should the bladder wall break down or decompensate back of an obstruction,[11] that is, allow a residual urine to occur, it would compensate rapidly on catheterization in the myogenic and slowly in the neurogenic, particularly if there should be marked diminution in sensation. In the hypertrophic bladder, removal of the catheter drainage without removal of the obstruction leaves a small capacity, high pressure, traumatized and so absorptive surface.

Completely contracted bladders back of traumatic or congenitally deficient outlets challenge an attempt to influence their innervation and so restore, at least an increased volume, a low pressure receptable.

I favor the opinion that sympathetic and parasympathetic action or function is present but that such an anatomic division cannot be correlated with function; that is, that the sympathetics in their principal anatomic distribution are by no means alone the nerves of bladder filling nor the parasympathetics the nerves of bladder emptying. It is important to establish this, as it influences such surgical procedures as presacral nerve resection.[12]

There are pain, some bladder dilator but many contractor fibers in the sacral nerve supply (parasympathetics) as well as in the hypogastric (sympathetics) nerve supply to the bladder. It has been demonstrated that, with complete section of the spinal cord below the sympathetic supply to the bladder, stimulation of a sacral somatic area can produce reflex inhibition of bladder contraction.[6]

In cases of dysuria in the presence of a normal central nervous system, this reflex inhibition is clinically important. It plays its part in postoperative and postpartum retentions. It can also be associated with extraneous trauma, even with a fractured hip. For example, should a person suffer such an accident and soon after develop a retention with overflow yet give a history of no dysuria previous to the injury, from a cystometric analytic standpoint as long as the patient is comfortable our cue is watchful waiting on the ground that it is a reflex, low pressure retention. With an uninfected urine and normal kidney function and the knowledge that this reflex inhibition will disappear, it is best to leave him just as the accident found him. Should the bladder remain overdistended with paradoxical overflow too long after the accident, a single catheterization to compensate or contract and thicken the bladder wall may be indicated, delaying it in the hope that an infection can be avoided.

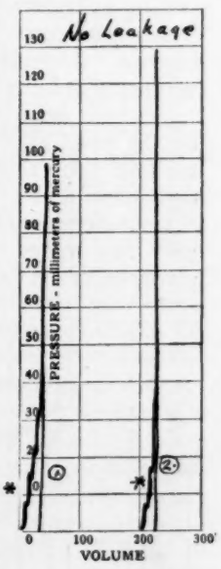

Chart 3.—Evidence in favor of the theory that such a thing as parasympathetic overbalance does occur. The tracings were taken in the case of a woman, aged 27, a college graduate, with enuresis all her life. She also presents congenital pinpoint pupils and nystagmus. The urine was not infected. The myogenic factor in this case is important in that frequency begets greater frequency through the medium of overwork of the bladder wall. This patient can be relieved for months by hydraulic distention.

Psychic influence is one of inhibition, and recently it has been demonstrated that even in markedly irritable bladders voluntary inhibition can be demonstrated on the cystometric chart. Section of the cord above the bladder supply removes this psychic inhibition;[6] for example, in a patient with some senility whose cerebration is further and rather abruptly interfered with by toxicity. If such an individual has a hypertrophic or compensated bladder wall, when the inhibition disappears urine may either drip constantly or spurt frequently in small amounts, owing to the continued contraction secondary to the release of inhibition. In such instances, catheterization would only increase or

9. Rose, D. K.: Urinary Incontinence, J. Missouri M. A. **32**: 363-367 (Sept.) 1935.
10. Simons, Irving: Studies in Bladder Function: The Sphincterometer, J. Urol. **35**: 96-102 (Jan.) 1936.
11. Rose, D. K.: Changes in the Wall of the Bladder Secondary to Prostatic Obstruction, Arch. Surg. **25**: 783-795 (Oct.) 1932.
12. Learmonth, J. R., and Braasch, W. F.: Resection of Presacral Nerve in the Treatment of Cord Bladder, Surg. Gynec. & Obst. **51**: 494 (Oct.) 1930.

prolong incontinence by further contracting and irritating the thickened and released bladder wall. I believe that nocturia, frequently the first symptom of prostatic hypertrophy, is due to the release of inhibition by sleep plus the increased strength of contraction of the bladder wall, compensated to the early obstruction.

Neurogenic bladders, by the aid of cystometrograms, can be studied with interest and classified to some extent. The procedure in these attempts is supplemental only. The greatest value lies possibly not in locating the lesion of the central nervous system but in demonstrating its effect on the bladder function and so enabling the clinician to wait with safety or to institute the proper procedure from the point of view of obtaining drainage of urine or infection.

In classifying neurogenic bladders cystometrically, whether the lesion is of the brain or cord or is peripheral, one must simplify it to terms of bladder function; that is, alteration of tonus of the bladder wall and outlet and the possible effects of one on the other, together with associated sensation. Opposing action of the bladder wall and internal sphincter as to contraction and dilatation is one unit, but their alteration in tone may associate with or be diametrically opposite to that of the voluntary, external sphincter. The latter is more complex than the action of the internal sphincter, comprising as it does direct urethral compression within the triangular ligaments as well as mobility of the prostatic urethra. Innervation of the skeletal muscles of the voluntary sphincter is by the pudic nerve.

On rare occasions pudic nerve neuritis is diagnosed on the basis of a spastic, irritable urethra and bladder without infection or other causative factor being demonstrable.

Considerable excellent work has been done in the past few years both on cystometry and on bladder physiology. It is work that, in time and with its better correlation, will give final and secure information, which can be used in cystometric interpretation.

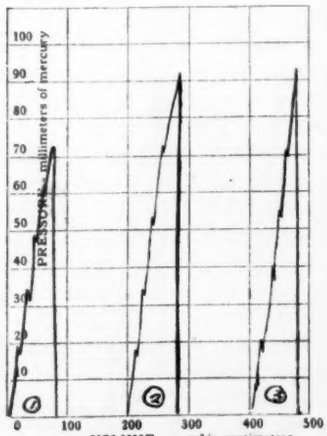

Chart 4.—Three tracings taken at one sitting demonstrating the type of bladder function occurring with cortical control release due to toxicity, in an individual with an early prostatic hypertrophy and a hypertrophic wall previously established.

Langworthy and Dees,[4] using their continuous record method, feel that it is possible to distinguish posterior from anterior root damage. The work done in spina bifida is based on the type of curve they obtain between the intermittent fillings of the bladder with 50 cc. of fluid. In this connection they stress that the mercury manometer is not as satisfactory as water. This adds a new principle, something more akin to the electrocardiographic tracing, and deserves further study. They feel that large, atonic bladders are due to injury of the posterior spinal roots. The statement of Denny-Brown and Robertson[5] that "apart from the faint background of maintained tonic activity, spontaneous vesical activity takes the form of waves of contraction appearing in rhythmical progression" lends hope that the type of the wave in a cystometrogram may be of diagnostic importance.

Cystometric determinations of brain tumors offer interesting speculation. We are assured of the inhibitory influence of the cerebrum. This can easily be proved by asking a patient to inhibit while a cystometrogram is being made.[6] It can be shown that the effect of removing this inhibition is, in general, decreased bladder capacity, if one remembers always to consider any complicating myogenic factor in making these observations.

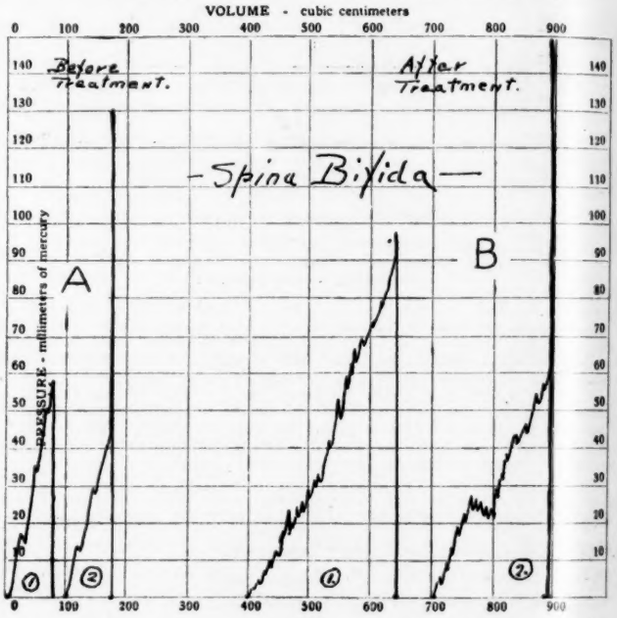

Chart 5.—The two curves represented in *A* are bladder tracings in a 10 year old boy with spina bifida, with a complete sacral anesthesia, posterior urethral anesthesia and a slightly spastic anal sphincter which, on stimulation by palpation, opens actively and remains in dilatation of increased tonicity. Besides spina bifida, the child has a hydrocephalus of mild degree, probably associated with an early operation for spina bifida, congenital dislocation of both hips and club foot. There was constant incontinence, so that orthopedic surgery was impossible. Hydraulic distention had been carried out once a day for a week when *B*, as represented by the last two curves, was obtained. The patient had a tremendously spastic bladder, which remains; the pressure is still high but the capacity is definitely increased. Associated with this bladder function, incontinence practically ceased, so that orthopedic surgery was possible on the hips.

Watts and Uhle[13] conclude that "abnormalities of bladder function, tone and sensation in patients with brain tumors are probably the result of a disturbance of bladder representation in certain parts of the brain, and present evidence of 'bladder representation' in the cerebral cortex, the region of the hypothalmus and even more caudal in the brain stem."

Enough work has been done to give promise to future endeavor to associate alteration in bladder function with specific brain disorder. As yet, however, in this regard the cystometer helps in the greatest degree in analyzing the change in bladder function so that it may be treated more intelligently.

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ABSTRACT OF DISCUSSION

DR. LLOYD G. LEWIS, Baltimore. My co-worker Dr. Orthello R. Langworthy was able to show experimentally that the urinary bladder is controlled by reflex arcs in the brain and spinal cord and that nuclei exist in the cerebral motor cortex and in the midbrain. By cystometric studies he showed the effects produced by interruption of either the motor or the sensory pathways in the brain and spinal cord. These are fundamental conceptions. Based on this experimental evidence, we set out to study the effect of isolated neurologic lesions

13. Watts, J. W., and Uhle, C. A. W.: Bladder Dysfunction in Cases of Brain Tumor: A Cystometric Study, J. Urol. **34**: 10-30 (July) 1935.

on bladder function in man. Last year it was my privilege to demonstrate before this section cystometric graphs in lesions of the motor pathways. This picture is nearly complete. We have continued to study the effects of sensory and complicated lesions of the brain and cord. We believe that it may be possible by correlation of data to know the neurophysiology of bladder control. I believe that Dr. Rose will concur that a cystometric study cannot replace a careful neurologic examination. A thorough neurologic examination is indispensable for the interpretation of cystometric data. The cystometric study does not obviate the necessity of performing complete urologic examination. We have used the cystometer to aid in the differential diagnosis between malfunctioning bladders produced by obstruction and neuropathology. But the cystometer is of paramount importance in the differentiation of neurologic lesions themselves. Is the lesion on the motor or the sensory side of the reflex arc? At what level are the arcs interrupted? What effects may drugs have on vesical function? Can relief of symptoms be expected by an operative procedure? These questions can possibly be answered by the aid of cystometry. In our simple laboratory and clinical equipment we have put up with cumbersomeness and inconvenience for the sake of graphic representation of every slight variation in bladder pressure. Dr. Rose should be congratulated on first devising a cystometer with a graphic recording apparatus. We prefer the water to the mercury outfit. We have tried both continuous and interrupted methods of filling, using both two-way and single catheters. We discarded the continuous inflow method because we found that two consecutive readings did not correspond. Dr. Rose's interpretation of these observations demands consideration, but we believe that interrupted filling by 25 or 50 c.c. increments gives added information by allowing us to study the stretch reflex. In upper motor neuron lesions, striated and bladder muscles behave alike in their response to sudden stretch, and hyperactive reflexes are obtained. There is no typical syphilitic bladder, there is no typical spina bifida bladder, there is no typical bladder involvement produced by transverse myelitis or brain tumor. The bladder abnormality depends on sensory or motor tract involvement.

DR. A. LLOYD STOCKWELL, Kansas City, Mo.: Clinical cystometry offers the most practical method to determine the normal or variations from normal filling of the bladder with urine under controlled conditions. Its limitations are largely lack of experience of the observer and obtaining accurate readings. Ever since Mosso and Pellacani first recorded, in 1882, fluctuations of the filled bladder on a smoked drum, studies on the bladder, particularly by the great investigators Rehfisch, Adler, O. Schwarz, Samuel Amberg, Muschat, D. K. Rose, and particularly Langworthy and Cobb, and Lewis, have made common knowledge the various expressions which the bladder registers against increasing distention in various normal and abnormal conditions. The outstanding work, however, is that of Dennie Brown and Graeme Robertson, in which the fundamental statement is made that to understand anything about the abnormal functions of the bladder one must first understand and determine how the bladder that has some degree of autonomy is still subjugated to the control of the will. I have been investigating bladder incontinence in children for the last year and a half, using a cystometer-sphincterometer of my own design that utilizes a two-catheter principle. It has produced results enabling me to increase accuracy in diagnosis and therapy for the child when he presents himself for relief of incontinence. The important fact about bladder control is that an enuretic individual has to learn to develop an inhibitory control. In other words, vesical control in the conscious (awakened state) or subconscious (sleeping state) is largely an inhibitory effect of the reactions of vesical distention. When interpreting cystometrograms, one must consider the position of the patient and fluctuation of psychologic factors at the time of examination and must correlate the desire to void, appreciation of temperature, the total curve, appreciation of discomfort and distention, and intactness of the sphincter or its lack of intactness at capacity. Evaluation permits a fairly accurate idea of intactness of central nervous system pathways, peripheral paths and local neuromyogenic factors.

DR. RICHARD CHUTE, Boston: To the urinary surgeon the practical importance of cystometry is the ability to be able to decide between a neurogenic bladder and prostatic obstruction. Just about once or twice a year I have a case in which it is very hard to tell whether it is a neurogenic bladder or prostatic obstruction. The muscular tone of the bladder may have been broken down by a prolonged losing fight against prostatic obstruction, with a mounting residual urine, and it may act like a neurologic bladder, and I think that the only way one can surely differentiate is by a neurologic examination, including cystometry, with possibly the use of drugs such as mecholyl. Cystometry will tell the difference between a neurogenic bladder and prostatic obstruction and will prevent operations for prostatic obstruction in a case of neurogenic bladder. I saw a man of about 60 who had had an abdominoperineal resection of the rectum for carcinoma. Not long after this he developed complete retention. One couldn't feel his prostate, of course, and by cystoscopy one couldn't tell. Through cystometry it was found that he had a neurogenic bladder and that there was no purpose in taking out the prostate, as had been recommended by another urologist.

DR. D. K. ROSE, St. Louis: It is a great pleasure to have this discussion. I think the work of Dr. Lewis has been a most valuable contribution. It is more of that type of work that is going to supply data on which to develop cystometry.

GROSS HEMORRHAGE FROM PEPTIC ULCER

ITS MORBIDITY, MORTALITY AND TREATMENT

LEON GOLDMAN, M.D.
SAN FRANCISCO

Many physicians believe that hemorrhages from peptic ulcer are rarely fatal. The potential dangers of this condition, therefore, are not fully appreciated. If one concludes, from his individual experience, that gross hemorrhage from peptic ulcer is rarely or never fatal, one is likely to offer a good prognosis, adopt a laissez faire policy and wait for the bleeding to stop. The records of pathologists, coroners and large city hospitals, however, show that the mortality of this complication is much higher than is generally believed.

For the purpose of arriving at a better understanding concerning the management of these patients, a study was made at the San Francisco Hospital of the 1,025 entries of 890 patients with peptic ulcer, from Jan. 1, 1928, to Dec. 31, 1934. Three hundred and forty-nine patients (38 per cent) entered the hospital because of gross hemorrhage from peptic ulcer [1] or developed this complication during the period of hospitalization. Of this number, thirty-nine (11.1 per cent) died of exsanguination, while an additional seventeen (4.9 per cent) died of conditions associated with the bleeding, such as perforation of the ulcer, pneumonia and cerebral or cardiac thrombosis, thereby bringing the total mortality of gross hemorrhage from peptic ulcer to 15 per cent. The reason for this apparently high mortality will appear later.

As bleeding peptic ulcer is not uncommon, such figures indicate the need for careful consideration of the problems involved.

From the Department of Surgery, University of California Medical School (the University of California Service at the San Francisco Hospital).

Read before the Section on Surgery, General and Abdominal, at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 13, 1936.

1. The term gross hemorrhage, in association with peptic ulcer, refers in this discussion to the vomiting of bright red or dark blood, or the presence of tarry stools, in addition to secondary anemia sufficient to produce weakness, pallor, dyspnea or rapid pulse. Patients with blood-streaked or occasional coffee-ground vomitus, occult blood in the stool or rare tarry stools are not included in this definition, as these are considered merely as signs of the activity of the ulcer.

PATHOLOGIC ANATOMY

By its very nature, it must be assumed that an ulcer which erodes a blood vessel and produces a gross hemorrhage is active and progressing. Ulcers in the stomach or along the anterior wall of the duodenum are more likely to heal early than those in the posterior wall of the first or second portion of the duodenum. The latter show more tendency to become chronic and to cause severe bleeding. The invasion of the retroduodenal and pancreatic tissue by an ulcer in the posterior wall of the duodenum causes an inflammatory process with adhesions to the periduodenal structures, thereby holding the ulcer open and enhancing chronicity. Fatal hemorrhage usually is caused by erosion of a large artery along the posterior wall of the first or second portion of the duodenum where it overlies the pancreas. In advanced cases, the bed of the ulcer is found in pancreatic tissue and the wall of the duodenum has been destroyed. In the crater there is a large sclerotic artery, running longitudinally or perpendicularly into the ulcer. In the chronic cases the arterial wall is surrounded by a variable amount of granulation or scar tissue, which assists in holding the artery open so that the lumen gapes and often will admit a fair-sized probe. The age of the patient is not necessarily an index of the inelasticity of this artery, as there is some evidence to suggest that the presence of chronic inflammation may produce arteritis or periarteritis and rigidity of the local vessels. In a smaller group of fatal cases, superficial ulcers are present with erosion of the submucosal vessels. Occasionally small granulating ulcers are found which, in the absence of other demonstrable cause, must be assumed to be the source of the fatal hemorrhage.

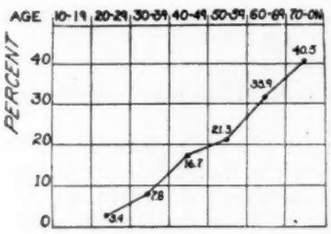

Chart 1.—Mortality percentage of all peptic ulcer cases by age groups.

The gastroduodenal artery, a branch of the hepatic artery, bifurcates, forming the right gastro-epiploic and the superior pancreaticoduodenal arteries. The latter vessel usually is the one involved in duodenal ulcer, because it supplies the area most commonly affected. The inferior pancreaticoduodenal artery is a branch of the superior mesenteric artery, and the vascular anastomosis behind the duodenum is so diffuse that it is unlikely that bleeding can be controlled except by the ligation of all these vessels. Bleeding from a gastric ulcer usually arises from one of the coronary vessels of the lesser curvature because the vessels lie between the layers of the lesser omentum closely applied to the wall of the stomach. Severe bleeding from ulcers of the greater curvative is rare because of the infrequency of benign ulcers at this site and the fact that the gastro-epiploic artery is not in direct contact with the wall of the stomach.

SYMPTOMS

The symptoms and signs of gross hemorrhage from peptic ulcer vary with the volume and rapidity of the loss of blood, which usually, although not always, corresponds to the size of the artery eroded. Exacerbation or recurrence of the symptoms of ulcer usually immediately precedes the onset of hemorrhage. Occasionally, however, bleeding occurs suddenly in the patient who has been without symptoms for a long time, or even in the patient with no history of such symptoms. Dietary indiscretion or indulgence in alcohol may immediately precede the onset of the hemorrhage. Nausea usually is the first symptom and may be followed by the vomiting of dark red, liquid or clotted blood, and by fainting. Either hematemesis or tarry stools may occur alone, or both may occur, whether the ulcer is in the stomach or in the duodenum. Tarry stools may not be present for some time after the hemorrhage, although, if it is severe, unchanged blood may be expelled from the rectum soon after the initial hemorrhage. Shock ensues after severe hemorrhage with a marked fall in blood pressure, rise in pulse rate, cold perspiration, and pallor. The extent of the hemorrhage cannot be judged early in its course by the hemoglobin or red blood cell count, as the loss is quantitative and not qualitative. It is not until the volume of the blood is restored by fluids from the tissues or by parenteral administration, that the drop in hemoglobin and red blood cell count becomes evident. In estimating the severity of the hemorrhage, therefore, and determining whether or not it has been controlled, one should be guided early in the course by the blood pressure, and later by the hemoglobin and red blood cell count as well as by the pulse rate, stool, and general condition of the patient. Gross hemorrhage from peptic ulcer must be differentiated from other causes of gastro-intestinal hemorrhage, such as ruptured esophageal varices, carcinoma, polyps or hemorrhagic diathesis.

MORBIDITY AND MORTALITY

There is obvious difficulty in evaluating statistical reports concerning peptic ulcer, especially as regards the bleeding type. That such difficulty exists is shown by the variation in statistics from different clinics. Eggleston [2] reported copious hemorrhage in 19 per cent of 500 patients with peptic ulcer, and this was present in 17 per cent of gastric and 14 per cent of duodenal ulcers in W. J. Mayo's [3] series. Balfour [4] reported the incidence of hemorrhage in 25 per cent of all patients with duodenal ulcer, followed over a period of ten years. Paterson [5] found severe or recurrent gross hemorrhage in 30 per cent of all patients with ulcer. The incidence in Crohn's [6] series was 29.5 per cent in gastric and 19.5 per cent in duodenal ulcer, while Hurst and Stewart [7] encountered 18 per cent in gastric and 19.5 per cent in duodenal ulcer. They, as well as Crohn, concluded that the incidence of gross hemorrhage in patients who are hospitalized is approximately 25 per cent, while, if the ambulatory or outpatients are included, the incidence is about 10 per cent.

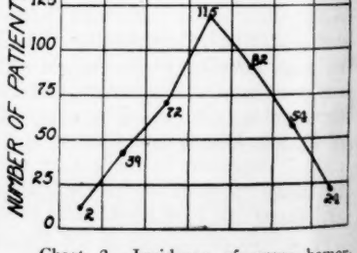

Chart 2.—Incidence of gross hemorrhage by age groups.

2. Eggleston, E. L.: A Critical Review of Five Hundred Cases of Gastric and Duodenal Ulcer, J. A. M. A. **75**: 1542 (Dec. 4) 1925.
3. Mayo, W. J.: Gastric Ulcer, J. A. M. A. **65**: 1069 (Sept. 25) 1915.
4. Balfour, D. C.: Surgical Treatment of Hemorrhagic Duodenal Ulcer, Ann. Surg. **96**: 581 (Oct.) 1932.
5. Paterson, H. J.: The Treatment of Severe Gastric and Duodenal Hemorrhage, Proc. Royal Soc. Med. **17**: 1 (June) 1924.
6. Crohn, B. B.: Affections of the Stomach, Philadelphia, W. B. Saunders Company, 1927.
7. Hurst, A. F., and Stewart, M. J.: Gastric and Duodenal Ulcer, London, Oxford University Press, 1929.

Reports from several hospitals indicate that it is not infrequent for patients with peptic ulcer to bleed to death. Chiesman [8] gave the mortality as 25 per cent of those patients having severe gross hemorrhage. Ross [9] of Melbourne reported 58 per cent of deaths in forty-three cases of severe bleeding peptic ulcer. The mortality in Allen and Benedict's [10] series was 14.5 per cent in 138 cases of sudden, massive duodenal hemorrhage. They believed the age of the patient and the presence of arteriosclerosis to be the most important prognostic factors. According to Lahey's [11] experience in his private hospital practice, 5 per cent of patients with gross hemorrhage died in the hospital before they could be prepared for surgical treatment.

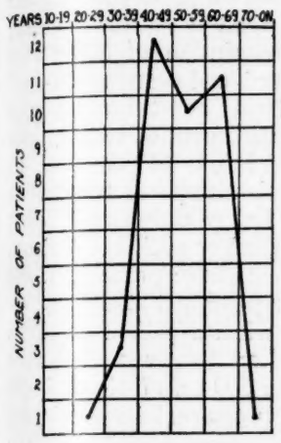

Chart 3.—Mortality from gross hemorrhage by age groups.

Hurst and Stewart, as well as Crohn, felt that the greater number of deaths occurred from the original brisk hemorrhage and that, if it did not cause death, subsequent bleeding would be relatively safe. Reports from other clinics, however, do not support this observation.

EXPERIENCE AT THE SAN FRANCISCO HOSPITAL

The San Francisco Hospital, a city hospital, cares for varied groups of patients, many of whom are in poor social and economic circumstances. These patients enter the hospital for urgent or emergency treatment. Because of the difficulties they encounter in following adequate therapy, the majority of those with peptic ulcer enter this hospital because of some serious complication. A very high incidence of hemorrhage can therefore be expected in this group. These statistics are from hospital patients of whom only a few returned for follow-up care.

During the seven-year period from Jan. 1, 1928, to Dec. 31, 1934, patients with peptic ulcer made up 1.1 per cent of all the hospital entries. Of this group of 1,025 entries (890 patients), 349 patients, or 39 per cent, entered because of gross hemorrhage, or this complication ensued after admission; 209, or 23 per cent, entered because of perforation of a peptic ulcer, and 332, or 37 per cent, entered because of obstruction, for medical care or for other reasons.

In a study of seventy-three cases of gastric and 165 cases of duodenal ulcer, proved by x-ray examination, surgery or autopsy, we found that, in the former, 64 per cent had hematemesis, 65 per cent had tarry stools, and 31 per cent had both. Of the duodenal patients, 50 per cent had hematemesis, 84 per cent tarry stools, and 34 per cent both. In general, it may be said that tarry stools occur more often and hematemesis occurs less often in duodenal ulcer, but, in a given case, one cannot conclude from these factors alone on which side of the pylorus the ulcer is.

The total mortality of patients with ulcer was 17 per cent (chart 1), increasing in direct proportion to the age of the patient; that of patients with perforation, both operated on and not operated on, was 32 per cent, the mortality rising with the number of hours elapsing before surgery. The mortality of gross hemorrhage was 11.1 per cent from exsanguination alone but rose to 15 per cent when the deaths from complications associated with hemorrhage were added. It should be emphasized in this connection that the additional 4.9 per cent mortality includes six patients in whom perforation ensued following the onset of hemorrhage, thus presenting two serious complications. Autopsy showed that in three of these patients an ulcer in the posterior wall of the duodenum had extended laterally in a circumferential manner and had perforated into the peritoneal cavity. Such evidence refutes the common impression that bleeding ulcers do not perforate. The remaining eleven patients of this group died of pulmonary, cardiac, cerebral or renal complications. We feel that these cases should be included in the mortality statistics, but, because the hemorrhage was apparently controlled in most of them, they are classified separately.

The incidence of gross hemorrhage reaches its peak during the fifth decade, and seven tenths of the hemorrhages occur after the age of 40 years (chart 2). In considering the mortality from gross hemorrhage by age groups, only those patients who were exsanguinated, as determined by autopsy, or those who died without other cause of death being specified, were included in our study. In all of these the hemoglobin was below 30 per cent and the red blood cell count below two million; there were, in addition, signs of syncope and clinical evidences of bleeding. The average age of the patients who died was 54 years, and the highest mortality was between the ages of 40 and 70 years when arteriosclerosis plays a part (chart 3). Of this group 70.6 per cent showed evidences of arteriosclerosis. Of the patients who died of exsanguination, approximately twice as many had duodenal ulcer as had gastric ulcer.

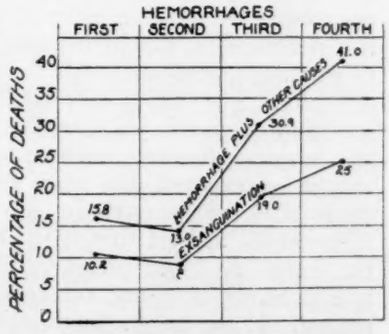

Chart 4.—Known number of gross hemorrhages and mortality.

Chart 4, showing the mortality in relation to the number of hemorrhages, demonstrates an abrupt rise in the mortality after the second hemorrhage. Approximately 40 per cent of these patients had had at least one hemorrhage before the onset of the illness for which they entered the hospital. This chart shows the mortality from hemorrhage alone as well as that from the complicating causes of death such as perforation, pneumonia, cerebral thrombosis and cardiac disease, though the bleeding ceased before death occurred.

The presence of a single gross hemorrhage or of recurrent hemorrhages indicates that the ulcer is not likely to heal under medical treatment. Jordan and Kiefer [12] found that, in 30 per cent of patients with a history of one gross hemorrhage from a peptic ulcer,

8. Chiesman, W. E.: Mortality of Severe Hemorrhage from Peptic Ulcers, Lancet **2**: 722 (Oct. 1) 1932.
9. Ross, K.: The Treatment of Hemorrhage from Peptic Ulcers, M. J. Australia **1**: 168 (Feb. 8) 1930.
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11. Lahey, F. H.: Selection of Operation in the Treatment of Gastric and Duodenal Ulcer, S. Clin. North America **14**: 1085 (Oct.) 1934.
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bleeding recurred within two years after medical treatment was instituted. In patients with a history of two hemorrhages before treatment, the incidence of recurrence was 63 per cent within two years. In a five-year follow up of all their patients with duodenal ulcer, they found that symptoms recurred in 54 per cent and concluded that gross hemorrhage was one of the chief signs that the ulcer probably would not yield to medical treatment. Repeated hemorrhage, therefore, means that the ulcer is likely to be intractable to medical treatment, that it will show little tendency to heal permanently under conservative treatment, and that, consequently, surgery is indicated.

TREATMENT

The immediate treatment of gross hemorrhage from peptic ulcer is essentially a problem both for the internist and for the surgeon, requiring close cooperation between them. By an understanding of the basic principles of therapy, hemorrhage might be controlled in a greater number of cases. Opinion is divided about many aspects of the management of such patients, but experience in the University of California Surgical Service at the San Francisco Hospital has led us to conform, in general, to the following plan:

1. The patient should be kept absolutely quiet in bed and, if shock is present, should be treated accordingly. As complete immobility as is possible should be maintained.

2. Morphine should be given in large enough doses to bring about mental and physical rest as well as to allay gastric peristalsis. It may be used in conjunction with atropine for the first few doses in an attempt to relax the muscularis and inhibit the formation of gastric secretions.

3. Frequent determinations of the blood pressure, hemoglobin and red blood cell count should be made during the critical stages.

4. Food by mouth should be withheld. As long as the patient is ingesting material into his stomach, gastric peristalsis is stimulated and, with the stimulation of peristalsis, permanent clot formation is attained with difficulty. The taking of food likewise stimulates the secretion of gastric juice, which is undesirable. Alkaline powders, however, may be administered. Feeding should be resumed only when there is conclusive evidence that the hemorrhage has stopped and has not recurred for at least forty-eight hours, as evidenced by the increasing blood pressure, the lowered pulse rate, rise in hemoglobin, and the general appearance of the patient. If the hemorrhage has ceased, small feedings may be instituted and gradually increased to a full Sippy regimen.

5. During the first twenty-four to forty-eight hours, parenteral fluids should be withheld in order not to decrease the viscosity of the blood. We give no fluids intravenously, except blood, during the active bleeding phase, as the rise in blood pressure may stimulate further bleeding. After the first day or two, saline solution, with or without dextrose, may be given by subcutaneous infusion or rectal drip.

6. There are many contradictory opinions concerning the values and dangers of the transfusion of blood, and some feel that it is better not to transfuse for fear of raising the blood pressure and causing further bleeding. Though, in our series, only 5 per cent of the patients who died from bleeding peptic ulcer had received transfusions of blood, we recommend this procedure for the reasons to be set forth. In our patients who died, the average length of life after the onset of bleeding was four and one-half days. In other clinics where transfusions have been used more freely, the average length of life was sixteen days. These comparative figures suggest that many hemorrhages can be controlled by transfusion. Allen and Benedict reported that in their opinion the transfusion of blood aided in checking the hemorrhage far more often than it started bleeding again; they advocated the transfusion of 300 cc. of citrated blood when the systolic blood pressure dropped below 70 mm. of mercury. Hurst and Stewart agreed that all patients should have the benefit of transfusions when the hemoglobin dropped below 40 per cent. In deciding whether or not a patient requires transfusion after an initial hemorrhage, Lahey estimates whether that patient could withstand another such hemorrhage. If it seems that a second hemorrhage probably would be fatal, the blood stream is replenished at once.

In our opinion, therefore, when a patient continues to bleed after adequate medical treatment, the slow administration of from 200 to 300 cc. of blood should be instituted before his blood pressure, hemoglobin and red blood cell count reach a hazardously low level. The beneficial effect on the anoxemia as well as on the mechanism of coagulation outweighs the possible dangers of transfusion. Obviously a suitable donor should be available at all times, as the patient may suddenly bleed considerably while under observation. The use of transfusions during the later stages encourages more rapid convalescence.

7. In our experience, the administration of so-called coagulants, such as thromboplastic substances or calcium, has no effect on the hemorrhage. The administration of epinephrine or astringents by way of a stomach tube probably has no effect if the bleeding is very severe.

8. Gastric lavage during bleeding from peptic ulcer has been advocated by some, but we feel that this should be reserved for those patients in whom the stomach becomes distended by the accumulation of blood clots. The tendency of lavage to break up a fresh clot and provoke further bleeding is too great to justify the use of this measure in a routine way.

If the foregoing regimen fails to stop the hemorrhage and bleeding persists or recurs while the patient is still fasting, we believe that early surgical intervention is indicated.

The prognosis for recovery on conservative treatment is poor in patients who continue to have serious hemorrhage or in whom repeated hemorrhages occur in spite of proper medical treatment (including the transfusion of blood). This is especially true in the patient over 40 years of age. One would like to defer surgery, if possible, in such cases, but it is probable that some form of surgical intervention will be necessary if the patient's life is to be saved.

Judgment of each case on its own merits is essential. The patient in question may have only a 20 to 30 per cent chance of surviving under further conservative treatment. One can reasonably assume that he is bleeding from a large artery, and the longer one waits the less his chance of survival will be. Three patients in our series were operated on too late during the acute bleeding phase—ten days or longer after the onset—with 100 per cent mortality. After from one to two weeks of intermittent or continuous bleeding, trans-

fusions afford very temporary benefit and the patient is poorly nourished, has a poor coagulating mechanism and is a poor surgical risk. For all these reasons we urge earlier surgical treatment in this type of case.

If operation is done during the phase of acute bleeding, a direct attack on the ulcer is advisable in most cases. If the ulcer is in the stomach, the vessels on all sides should be ligated and the ulcer sutured; or, if the patient's condition permits, it should be excised and gastro-enterostomy performed. In the treatment of duodenal ulcer, excision may be impossible, since many of these ulcers are on the posterior wall of the duodenum. Because of the higher incidence there, ulcer of the duodenum should be suspected if the stomach appears to be normal. The operation devised by Allen and Benedict is the procedure of choice when surgery is indicated for bleeding duodenal ulcer during the acute phase. The stomach is transected between clamps at the prepyloric region, and the duodenal end is elevated. The blood vessels entering the ulcer are ligated outside the duodenal wall and the duodenal end is turned in. An anastomosis is then performed between the stomach and the jejunum. This affords the greatest protection against recurrence of the ulcer or subsequent hemorrhage. Suturing the bed of the ulcer in the posterior wall of the duodenum is not practical because of the friability and fixation of the inflamed tissue. It is at such a time that one's surgical judgment must be the deciding factor. Gastro-enterostomies have been done during the acute phase, with cessation of hemorrhage, when attacking the ulcer directly did not seem feasible. In a high percentage of cases in which this method is used, however, recurrence of the hemorrhage takes place.

We feel that, in the case of a first hemorrhage, the patient should be given a chance for relief under medical care unless he was following a strict regimen at the time the bleeding began. If hemorrhage recurs, however, surgery is indicated during a quiescent state. Even though transitory healing has taken place and roentgen examination after from three to four weeks of medical care fails to demonstrate the presence of an ulcer, the lesion may recur at the same site. At operation during such a stage, only a small dimple may be seen at the site of the previous erosion.

When the operation for bleeding peptic ulcer is done in the quiescent stage rather than during a phase of active bleeding, the procedure of choice, if the patient's condition and other factors permit it, is removal of the area around the ulcer by partial gastric resection, with anastomosis of the proximal portion of the stomach to the jejunum. This procedure removes the vulnerable portion of the duodenum and brings about such profound changes in the gastric physiology that the mechanical and chemical factors which were chiefly responsible for ulceration are more or less completely and permanently controlled, thereby offering freedom from recurrence in the majority of cases. Indirect procedures, such as gastro-enterostomy or pyloroplasty, are followed by a relatively high percentage of recurrences as well as by the added danger of gastrojejunal ulcer, but the operative mortality is relatively low. The direct procedure of partial gastric resection, on the other hand, carries a higher mortality but a lower incidence of recurrence. Many times induration and inflammatory reaction about the duodenum cause difficulty in its inversion. In such cases it is probably advisable to allow the ulcer to remain and to transect the duodenum proximally, ligate the vessels and perform a gastric resection. Surgical judgment of all the factors involved must determine the procedure to be undertaken.

SUMMARY

A study of the cases of bleeding ulcer at the San Francisco Hospital reveals a higher mortality than was previously supposed. Death occurred rarely below the age of 40 years but was not infrequent between the ages of 40 and 70 years. Arteriosclerosis is an important factor affecting the incidence and mortality of this condition. Death from bleeding duodenal ulcer is twice as common as from gastric ulcer, because of the higher incidence of duodenal ulcer and its tendency toward chronicity. Repeated hemorrhage shows a rising mortality with each attack, indicating that the ulcer is likely to be intractable to medical treatment and hence surgery should be considered. Early, direct surgical attack on the ulcer should be considered for the patient in the sclerotic age who continues to bleed from a peptic ulcer, while under adequate medical treatment — including transfusions.

Room 111, University of California Hospital.

ABSTRACT OF DISCUSSION

DR. S. L. LEDBETTER JR., Birmingham, Ala.: Dr. Goldman reports 1,025 entries of 890 patients with peptic ulcer, and of this number 349 patients (or 38 per cent) entered the hospital because of gross hemorrhage. Of 603 cases in a series in Birmingham of the past three years forty-nine patients (or 8.1 per cent) were admitted on account of massive hemorrhage, thus showing a much smaller percentage than he reports. Dr. Goldman's statistics show that 23 per cent of all ulcer patients entered because of perforation, while 18.5 per cent of the Birmingham patients entered on account of perforation. His records show that massive hemorrhage is much more common than perforation, while our records show that perforation occurs over twice as often as massive hemorrhage. I do not know how to explain this unless it is due to the fact that the type of ulcer seen in our locality is smaller and less extensive. American surgeons visiting abroad report that the type of ulcer seen there is much more extensive and accompanied by more infiltration and inflammation than ulcers seen in this country. The ulcers that I have seen have almost all been small duodenal ulcers with a tendency toward perforation rather than toward hemorrhage. As Dr. Goldman reports 11 per cent of deaths from exsanguination from the records of the San Francisco City Hospital, I was interested in comparing statistics from the private hospitals here with those from our local county hospital. Several of our leading internists have not had a private patient die from massive gastric hemorrhage. During the past three years in our local county hospital twenty patients were admitted with massive hemorrhage with three deaths, a mortality rate of 15 per cent. In the private hospitals there was only one death in twenty-nine cases, a mortality rate of 3.4 per cent. This shows conclusively that the private patient who is receiving adequate medical care is less apt to have a hemorrhage, and, if he does, treatment is instituted more promptly and with a much lower mortality. Only 6.9 per cent of our cases were admitted to private hospitals on account of hemorrhage, whereas 10.8 per cent of the admissions to the Charity Hospital were on account of hemorrhage. Fifty-four cases (or 29 per cent of all ulcer cases) were admitted to the County Hospital on account of perforation, whereas fifty-eight (or 13.8 per cent) were admitted to private hospitals. I am in accord with Dr. Goldman in practically everything he has said regarding the treatment. It is one of complete rest to the individual, complete rest to the stomach, and transfusions when indicated. As morphine nauseates a fair percentage of persons, it is advisable to attempt to promote rest by the use of barbiturates or other sedatives. When there is pain, morphine is necessary. Atropine is useful to relax the spasm of the pylorus. In addition to saving life, blood transfusion hastens convalescence. With improved resistance the patient is in better condition to withstand possible concomitant disease.

DR. J. WILLIAM HINTON, New York: Dr. Goldman's presentation is valuable because he has such a large number of cases. He reports 349 bleeding ulcers in 890 cases, or 38 per cent, with thirty-nine deaths, or 11 per cent mortality. In the Fourth Division of Bellevue Hospital since 1928 we have encountered 100 bleeding ulcers. This covers a bed capacity of 200 patients, with an average weekly admission rate of eighty patients, with 361 ulcers admitted to the whole hospital annually, or ninety ulcers per division each year, with an average of twelve bleeding ulcers for the past eight years. In other words, 14 per cent of our total hospital admissions have shown severe gross hemorrhage. I am, of course, reporting for a city institution, and it is interesting to review the figures that the author shows, in which approximately 25 per cent of the hospitalized patients have gross hemorrhage and 10 are ambulatory patients. That has certainly not been our observation. Since 1928 we have had 761 peptic ulcers under observation in our clinic. Of this number 577 have been ulcers not operated on; of that number only twenty have bled, or 3.3 per cent. These patients have remained under close observation and made a sum total of 14,232 visits. As to the treatment of bleeding ulcers I essentially agree with Dr. Goldman but feel that it is essential to divide the patients into five groups. In the first group are patients who have been under competent medical care. As I have stated, we had only 3.3 per cent in that group. I feel that it is not necessary to operate on these patients with the first hemorrhage. If they have a recurrent hemorrhage it may be necessary, but so far we have had but one patient out of these twenty bleeding ulcers for whom we have advised operation. In the second group are patients who have been operated on for acute perforated ulcer or for chronic ulcer and who have never bled for months or years following operation. In that group we had 12 per cent of our cases. In the third group are patients who have been operated on for bleeding ulcer and who have continued to bleed. Seventeen per cent of our ulcers have been operated on for either acute perforation or for bleeding ulcer and have continued to bleed. We do not operate on these patients unless a definite marginal ulcer can be demonstrated, and that has been done in approximately 20 or 25 per cent. The fourth group is the important group. In that group we have had 14 per cent of our patients and it is here that we have our mortality. These patients with a severe hemorrhage have never had any ulcer symptoms at all until they collapsed as a result of the hemorrhage. Of these we have had nine deaths. All the patients were treated by conservative measures, and I should like to state that their condition was so extreme, or they died so rapidly, so soon after entering the hospital, that surgery could not have been undertaken if one had so desired.

DR. LEON GOLDMAN, San Francisco: As far as the occurrence of perforation with hemorrhage is concerned, especially in the duodenum, one may conclude that, if the ulcer is in the posterior wall of the duodenum, hemorrhage may occur because of anatomic reasons. It is on the posterior wall of the duodenum that the large vessels are found, namely, the branches of the hepatic artery which supply this part; the anterior wall is flexible and covered by peritoneum, so that an active ulcer which penetrates may perforate into the free peritoneal cavity. A penetrating ulcer of the same type in the posterior wall is more likely to cause hemorrhage. For this reason, perforation and hemorrhage do not very often occur at the same time. I think that a more active policy in the control of bleeding peptic ulcer must be adopted. It was the conception of many of us that death from hemorrhage is very rare. In the study of our cases we were much surprised by the incidence and high mortality of this condition. We feel that if, after giving the patient the benefit of conservative measures, hemorrhage still continues, and the patient is above the age of 40, with arteriosclerosis, something more has to be done; otherwise the patient's chance of surviving the hemorrhage is very poor. I do not wish to give the impression that operation should be performed on every patient who enters the hospital with a bleeding peptic ulcer during the acute stage. I do, however, believe that there are certain patients, above the age of 40 and with arteriosclerosis, who bleed in spite of what can be done for them medically. If something more active is not done, the mortality rate, which is rather high, will continue to be so.

THE RELATION OF THE SANATORIUM TO THE TREATMENT OF TUBERCULOSIS

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With the discovery of the tubercle bacillus in 1882, the world expected tuberculosis as a disease affecting mankind had been as effectively conquered as had smallpox after the introduction of vaccine by Jenner. Dr. Trudeau had sought the Adirondacks, where he proved at least that his life was not to be snuffed out in the twinkling of an eye and later established the Cottage Sanatorium for the treatment of tuberculosis. Here he proved by the trial and error method that rest plus good food and fresh air could arrest the disease in a fair percentage of cases. He learned in the school of hard knocks what is common knowledge today but lived to give all who came after him a comprehensive knowledge of the disease and the fundamentals in its treatment.

Climatic treatment of tuberculosis had been empirical up to this time, and patients had been advised to change climates as far back as records can be traced. Mountains, seashore and deserts all had their day, but it was Dr. Trudeau's experiment in the Saranac Lake section that started the country on a sanatorium-building period which ultimately placed sanatoriums in practically every state in the union.

EARLY DAYS OF SANATORIUM TREATMENT

The Southwest and Western seaboard saw the majority of private institutions built, while the East began the erection of state and later county and municipal sanatoriums. The movement spread like wild-fire and the modern treatment of tuberculosis was begun in earnest. Again we were behind Europe as to priority, but once the movement started we outstripped them in things accomplished. In the mad race to build home institutions climate was forgotten and the slogan "Stay at home and be cured" cut the percentage of climate chasers to the minimum. However, up to the world-wide chaos of 1929 those who could afford the luxury of climate still kept the health resorts full to overflowing. Then the crash, and with it the empty pocketbooks. The home institution came into its own. By home institutions I mean the state, county and municipal and not the private sanatorium; that suffered along with its climatic relative. People flocked to the place that made it possible to cure with little or no expenditure of money, and the wails of the private sanatorium owner both east and west mingled in one mighty cry, which still echoes from Maine to California and from Canada to the Gulf. But more about this later. These individuals have a real grievance.

In the early days the sanatorium treatment consisted of rest, good food, fresh air and expert supervision. There was little else to offer a patient. The progress of the disease had to be watched and the prognosis given by what the clinician could gather from physical examination and clinical symptoms alone. The advent of the x-rays and the various laboratory tests for determining activity and the progress in general were yet to come.

Read before the Section on Miscellaneous Topics, Section on Tuberculosis, at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 13, 1936.

For this reason, namely, close supervision, patients needed an institution and were more successfully treated there, as their regimen was outlined for the entire twenty-four hours and, what is more to the point, some one saw that this routine was carried out. When one asks for an argument relative to the value of sanatorium over home treatment and the questioner has stated that he will follow the same advice on routine at home, tell him it has never been done and that the proof of the pudding is the eating—sanatoriums can boast results that were never dreamed of by home treatment.

My personal experience also bears out this statement. For eighteen years I was directly connected with institutions, most of those years as medical director, and for the past twelve years I have been doing a private practice. For satisfaction from all angles, the institution is far superior. In order to offset partly the disadvantage of private work I attempt to place all patients in the beginning under sanatorium care in so-called open institutions. Here there is nursing supervision and routine is carefully looked after. Still I firmly believe that a sanatorium with a medical director in charge is preferable.

I have attempted to show that in the beginning the sanatorium was a necessity for properly carrying out the rest regimen. Nor has the advent of collapse therapy made it of less value to the patient who has just been given his diagnosis and must be started on his tuberculosis education. Education of the tuberculous is best accomplished in the institutions. There is no more comparison between the sanatorium-educated patient and the home patient than there is between the correspondence school pupil and the student of a recognized university. The one is as handicapped in his fight for continued health as the other in his struggle for economic existence.

COLLAPSE THERAPY AND ITS RESULTS

Collapse therapy has changed the attitude of many specialists in tuberculosis in their relation to the sanatorium. In many cities, patients are given artificial pneumothorax at dispensaries and allowed to continue work in the early months of treatment. The lay magazines are making much of this "new cure" for tuberculosis. Even medical men are carried away by the spectacular results obtained, with the inevitable result that the average patient thinks that if he or she can have a pneumothorax needle thrust into the pleural space or a phrenic nerve pulled out, their troubles are immediately at an end and the longed-for cure accomplished.

I realize as keenly as any of my colleagues that economic situations alter cases and that what can be done for an individual in one stratum of economic life cannot be done for one in a lower stratum. Many times a patient comes to my office with barely enough money to buy bread. He has reached the desert, chasing a will o' the wisp, hoping that the dry air will restore a worn-out physique and the sunshine contract a cavity which occupies a third of his lung. That man must have something done for him. There are no charitable institutions in New Mexico, but there are people running sanatoriums with the milk of human kindness tucked away inside. I put this patient to bed for a period long enough to collapse the bad lung and let him work. No doubt the dispensary care in large cities I referred to comes under that classification. Something must be done for that type. By collapse therapy we have made it possible for this patient to resume his occupation and, if the collapse is complete, rendered him no longer a menace to those with whom he may come in contact.

But when we advocate this type of treatment it is because of economic necessity. It is not the ideal in compression therapy. It's a makeshift and must be looked on as such. A collapse of a lung doesn't cure tuberculosis; it merely gives nature a chance to effect a result. It is unfortunate that medicine is penalized and forced into makeshift methods by a society that penalizes human beings and makes it necessary to offer half-way measures to prolong downtrodden lives.

To those more fortunate individuals, time makes for much better end results. They can and should be advised to enter a reputable sanatorium and there under proper conditions the patient has the advantage of study and, when this study is complete, sane advice can be given as to methods of treatment. It may or may not be some form of collapse but, if collapse it is, continued residence in the institution of choice makes for a successful outcome.

I have spoken of pneumothorax and I think hinted at phrenic exeresis but have not touched on thoracoplasty, which brings us to major surgery and therefore calls for a discussion of the properly equipped sanatorium for all types of collapse treatment. The institution of early days needed a well appointed kitchen, an attractive dining room, a recreation hall and units for the accommodation of patients. Perhaps an infirmary could be found in a few if one searched long enough. A laboratory was a necessary adjunct for the routine examinations; later, x-ray machines became a necessity; but until recent years many plodded along with meager equipment. Now if an institution gives the best that is possible in the care of the tuberculous it must add a surgical unit or have access to a general hospital in a relatively short distance from the sanatorium grounds, so that the close cooperation between surgeon and tuberculosis specialist may exist, for this relationship or lack of it spells many times the difference between success and failure.

Where surgical units or access to nearby hospitals are lacking, it becomes necessary for the patient to travel long distances and to be placed in the hands of a surgeon who knows nothing of the individual except that some doctor wants his ribs removed. In the final analysis the medical man is the one whose judgment prompted the operative advice, and the successful chest surgeon is the man who understands this fact and works in close association with his medical colleague.

PRIVATE SANATORIUMS

I now come to the last phase of this discussion. What of the private sanatorium and its struggle for existence? Where will this struggle end? Unless something is done to meet the situation, the answer is failure. There can be nothing else under existing conditions. The state, county and municipal institutions are taking the private patient at the expense of the privately owned sanatorium. The man who owns his institution should have some protection. He along with the rest of the tax-paying group is helping support the institution that is forcing him into bankruptcy. When these institutions were built it was the opinion of most of us, I believe, that they were for the care of indigents or people who could ill afford private sanatoriums. If we were right in this opinion, time has changed the purpose for which they were erected. Now any one can enter these institutions and get away with it. The waiting list is long, and, in many, patients wait months

before there is a vacancy. Often this prolonged wait spells failure to regain health. And yet nothing is done about it.

It all resolves itself into the present-day agitation for lower cost for medical care—a problem which merits careful consideration, another entering wedge for state medicine which is fast becoming a reality in one form or another. Let me digress long enough to say that I have no quarrel with state medicine per se, but I do object to practicing state medicine in a capitalist society. No group should be singled out and legislation enacted to cover that particular group. As long as the profit system exists, doctors should be given the same chance that our government extends to the magnates of industry.

But we are not dealing with economics. Something constructive must be suggested for the private sanatorium owner. In New Mexico we are without a state sanatorium. For years we have recognized the fact that something must be done for the indigent who are residents of the state. Our present plan backed by the state board of health and all health agencies is to get a sufficient appropriation through the legislature to place these people in existing institutions. In that way, overhead can be cut and empty beds can be filled. It seems to me that by concentrated effort on the part of individuals and associations such as this some pressure could be brought to bear on all existing state, county and municipal institutions to force them not to accept patients who are able to pay for private sanatorium care. Further, rather than have more expenditure of state moneys to add beds to already existing institutions, awaken sentiment for such plans as New Mexico is attempting and which is already being done in Colorado, Texas and I suppose other states.

Further than this I have nothing constructive to offer, but I still feel that collective effort by such organizations as ours may in time bear fruit and if such effort proves wasted, the private sanatorium will live only in the memory of pioneer workers in the field of tuberculosis.

221 West Central Avenue.

ABSTRACT OF DISCUSSION

DR. ALEXIUS M. FORSTER, Colorado Springs, Colo.: In spite of Dr. Peters' dark picture, I believe that the best of our private sanatoriums will survive, because they offer certain advantages which will not be overlooked either by physicians or by patients. All the factors working against us have now reached the peak. I believe with Dr. Peters that the three chief factors have been the economic situation, the propaganda against climate and the rapid development of chest surgery. With improvement in economic conditions, patients will again seek the advantages we have to offer. There are sufficient doctors still left who recognize that favorable climate together with the essentials of care and treatment do offer the patient a better chance of recovery. Scattered over the country in general hospitals are many orthopedic patients who could derive incalculable benefit from the abundant natural heliotherapy available in the West. I believe that these private institutions must seek a subsidy of some sort. It must be recognized that no hospital can keep up the present high standards of care and treatment with the funds its patients are able to contribute. Those of us who have struggled through these years of adversity ask of our fellows a fair consideration of the advantages we are able to offer. Favorable climate, natural heliotherapy, privacy and close individual care many times may turn the scale. I believe that the private sanatorium with up-to-date medical and surgical equipment, and with endowment, public or private, will continue to receive adequate support from the profession throughout the country.

DR. C. M. HENDRICKS, El Paso, Texas: It seems that Dr. Peters' remarks could be divided into two phases; viz., Should a private patient be sent to a private sanatorium? and Can the private sanatorium be saved? I do not believe that any member of our profession would argue against the fact that a sanatorium-trained patient is of less danger to his community than the home trained patient. There is no substitute for rest in the treatment of pulmonary tuberculosis, and certainly this rest can be carried out much more efficiently under the watchful eye of the attending physician in a sanatorium than in the home. Then, too, comes the question of the greatest good to the greatest number, which means the isolation of every open case. It seems that, if we are eventually to win the fight against tuberculosis, we must bend our efforts toward the isolation of the open case as well as the early diagnosis and education of the patient. All three can best be accomplished in the sanatorium. Now what can be done to save the private sanatoriums from bankruptcy? I have no quarrel with the tax-supported institutions; they are absolutely necessary and I am for them whenever and wherever they are needed. I think that every physician does, however, have a quarrel with the existing laws and customs under which tax-supported institutions are conducted. Certainly no man should expect to receive sanatorium or hospital care for any disease at the expense of his fellow taxpayers. I know of many tax-supported institutions which admit patients at 5 or 10 dollars a week, the law providing for this, regardless of the patient's financial status. The word "indigent" has never been properly defined by law. The first step, then, toward the protection of private institutions would be to secure as soon as possible a change in the laws governing some of the tax-supported institutions; also to assist the state, county and city and reducing their waiting list by having provisions made by these governments whereby the empty beds in private sanatoriums may absorb these patients, rather than construct new additions to the already oversized tax supported institutions, and I recommend that you work for a law in each state compelling the isolation of the open case. Today the position of the chest specialist and the private sanatorium should be a warning to all other branches of medicine and surgery.

DR. VICTOR STRONG RANDOLPH, Phoenix, Ariz.: I want to say a word on a phase that has been neglected in the discussion of Dr. Peters' paper. I am not financially interested in any sanatorium. I am however interested in chest surgery, and Dr. Peters mentioned the fact that sanatorium treatment has lapsed to some extent because of the advent of collapse therapy. My brief remarks are to this effect: The sanatorium routine and the sanatorium treatment are still the most important feature in the treatment of tuberculosis. And that should be heralded just as the fact has been heralded in recent years that many patients do need collapse therapy early. The sanatorium man today is recognizing that fact. And we as chest surgeons also should point out that the sanatorium routine is important, for the preparation of the patient, to get him into shape so that he will be benefited by surgery, and, in addition, that the results of surgery will not be effective unless the sanatorium routine is carried out after he has had his surgical treatment.

The Tonic Innervation of the Colon.—The alimentary canal may be regarded as having two reservoirs connected by a long tube, the small intestine. The first reservoir, the stomach, receives a large amount of food at one time and discharges it gradually into the intestine, where the final stages of digestion occur. The second reservoir, the large intestine or colon, receives gradually the waste material left from the digested food and discharges it at one time. The tonic innervation of the colon is quite as important as that of the other parts. It is provided by nerves belonging to the sacral division of the autonomic system. Stimulation of these so-called "sacral visceral nerves" causes contraction of the muscles of the colonic wall. The extent of distribution of these nerves in the large intestine of man has not yet been determined.—Cannon, W. B.: Digestion and Health, New York, W. W. Norton & Co., Inc., 1936.

THE OPERATIVE VERSUS THE MANIPULATIVE TREATMENT OF SLIPPED FEMORAL EPIPHYSIS

WITH A DESCRIPTION OF A CURATIVE OPERATION

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The treatment of slipped femoral epiphysis, sometimes called epiphysiolysis, epiphyseal fracture of the hip joint, epiphyseal coxa vara, or osteochondritis of the neck of the femur, is still perplexing and in a state of flux because of the poor ultimate results obtained by the present methods. The literature is replete with end result studies that are, to say the least, discouraging. It is because of these failures that a number of investigators have proposed new methods of procedure. It is not our purpose to enter into a clinical description of this condition but rather to consider certain features of the anatomy and physiology of the hip and of the symptomatology which have a bearing on the rationale that should guide the orthopedic surgeon in his therapy.

ANATOMY AND PHYSIOLOGY

With the approach of puberty several anatomic and physiologic features become manifest: 1. The epiphyseal plate between the head and the neck of the femur changes its position from the horizontal common in childhood to the oblique plane. 2. There is an increased growth activity in the epiphyseal region with a consequent widening of the epiphyseal plate. 3. There is a decrease in the thickness of the periosteum and of the retinacula of Weitbrecht which supports the epiphyseal plate and holds the head firmly attached to the neck. 4. The femoral neck becomes longer and its angle with the shaft is lessened, while its size and the density of bone structure are increased. 5. There is a relative gain in body weight. 6. There is an increase of the general physical activity. The first four enumerated conditions produce a physiologic weakness at the epiphyseal area. The two latter conditions produce an increase in the stress and shearing strain on the epiphyseal area.

When these changes are within normal limits, the balance between the ability to withstand stress and strain and the stress and strain superimposed is maintained and no pathologic disturbance occurs. On the other hand, when these changes are beyond normal limits this balance becomes disturbed and pathologic changes occur. Thus, if the plane of the epiphyseal line is so oblique as to be almost vertical or the thinning of the periosteal attachment of the femoral head is greater than normal, the ability of the parts to withstand normal stress and strain is reduced. Then too, if the rate of growth between the head and neck is abnormally fast, the epiphyseal plate would be wider than usual and consequently weaker and less able to withstand the usual superimposed forces. Furthermore, an unusual increase in body weight as in cases of endocrine dyscrasia (the obesity in cases of Fröhlich's syndrome) or excessive physical activity would impose a greater degree of stress and strain than the part can withstand. Finally, there may be a combination of these two groups of factors to produce a disturbance of the balance of opposing forces.

In the mechanism of the displacement, actual slipping of the femoral head may occur in one of three ways: It may be very gradual over a considerable period, may be very sudden, or may be gradual and then be completed by rapid displacement. The sudden slipping may have all the appearance of a fracture of the neck of the femur, but we cannot accept it as such, for, as Mr. Perkins [1] has pointed out, a fracture dislocation of an epiphysis always involves the metaphysis at one point or another. Furthermore Rammstedt [2] found experimentally that in producing a traumatic epiphyseal separation a fragment of the neck was broken off with the head. In the condition under consideration, the lesion is entirely through the epiphyseal plate.

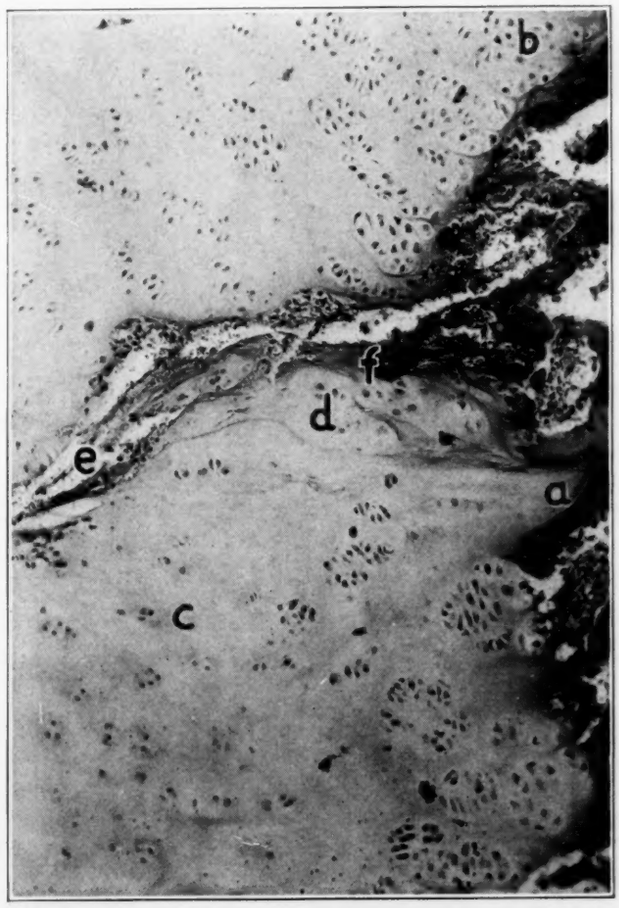

Fig. 1.—Section of epiphyseal plate (× 125) showing mild changes from normal: *a*, the line of demarcation between cartilage and bone is relatively straight but definitely more irregular than normal; *b*, the columnar arrangement of the proliferating cartilage is only relatively normal; *c*, "resting" cartilage is well preserved; *d*, area of "resting" cartilage undergoing changes; *e*, split in "resting" cartilage invaded by blood vessels from metaphysis; *f*, fiber bone formation.

GROSS AND MICROSCOPIC PATHOLOGY

The gross pathology observed during an arthrotomy is definite and characteristic. The slipping of the head occurs downward and backward. The epiphyseal plate is wedge shaped with its base anteriorly and superiorly. The femoral head is firmly fixed to the neck and can be removed only by instrumentation. There is no line of solution of continuity. One gets the impression of a gradual wandering of the head downward and backward, resulting from a plastic change in the epiphyseal plate. The femoral neck bulges and appears longer

Owing to lack of space, this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

Read before the Section on Orthopedic Surgery at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 15, 1936.

1. Perkins, George: The Treatment of Adolescent Coxa Vara, Brit. M. J. **1**: 55 (Jan. 9) 1932.
2. Rammstedt, Conrad: Ueber traumatische Lösung der Femurkopfepiphyse und ihre Folgeerscheinungen, Arch. f. klin. Chir. **61**: 559, 1900.

anteriorly and superiorly. The periosteum in this region is markedly atrophied. The articular cartilage is normal in appearance. Anteriorly and superiorly, however, the border of the epiphyseal plate articulates with the acetabulum so that there is an incongruity of articulating surfaces. The ligamentum teres may be elongated and when sectioned is practically avascular or so poorly vascular that it never requires ligation. The acetabulum is normal in appearance. In old cases the capsule of the joint is thickened anteriorly and superiorly. The joint fluid is normal in appearance and in quantity.

A review of the resected epiphyseal areas, in which we were kindly aided by Dr. Sheldon Jacobson of the department of pathology of the Hospital for Joint Diseases, revealed a changing microscopic picture, which varied with the severity of the lesion. In the early stages (fig. 1) the line of demarcation between the cartilage and bone is relatively straight but definitely more irregular than normal. The columnar arrangement of the proliferating cartilage cells is evident but irregular and the number of cells per column is diminished. The "resting" cartilage is fairly well preserved and presents splits, some of which are invaded by blood vessels from the metaphysis, while others are filled with granulation tissue. In other views one may see areas of fiber bone and osteoid surrounded by "resting" cartilage. This may be interpreted as a reparative process in the splits noted in the "resting" cartilage, and the resulting fiber bone is not lamellar but is the product of the ossification of connective tissue cells. Occasionally one may note areas of myxoid degeneration in this region. The osteoid tissue at the line of junction with the proliferating cartilage cells is irregularly disposed, and the newly formed lamellar bone is similarly irregularly disposed and in part replaced by fiber bone. The adjacent marrow in the femoral neck presents a moderate amount of fibrosis. Occasionally cartilage rests may be seen in the metaphyseal region.

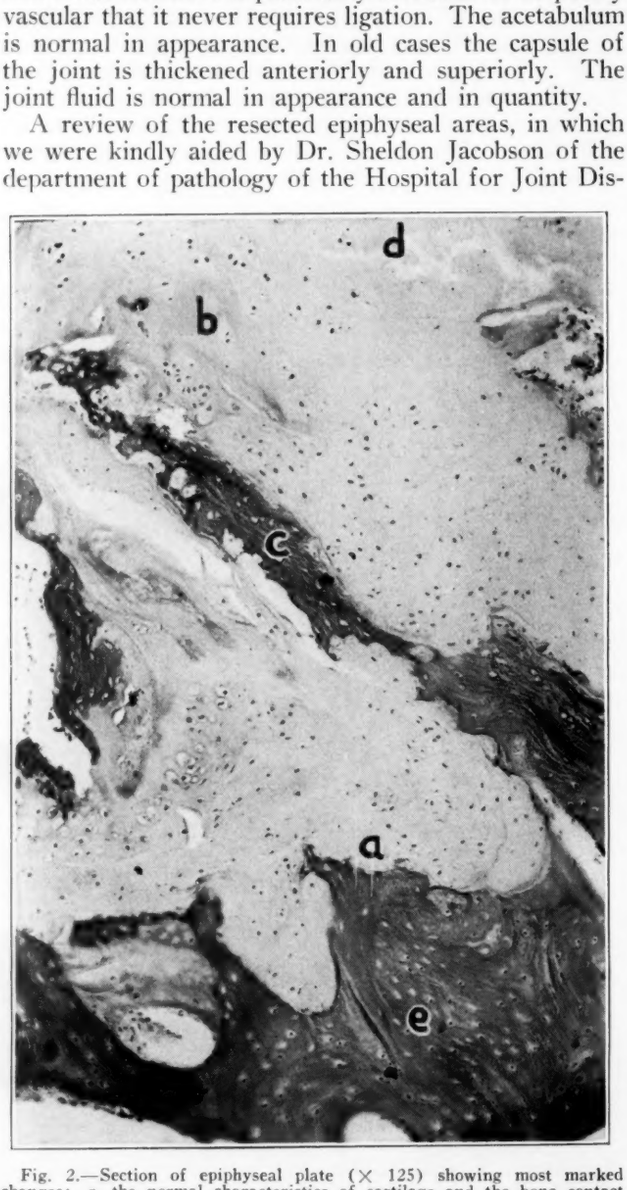

Fig. 2.—Section of epiphyseal plate (× 125) showing most marked changes: *a*, the normal characteristics of cartilage and the bone contact zone are entirely lost; *b*, area of myxoid degeneration of cartilage; *c*, area of fiber bone in cartilage plate; *d*, split in cartilage plate; *e*, lamellar bone. Note absence of columnar arrangement of proliferating cartilage and absence of endochondral bone formation.

In the moderately advanced stages the line of junction between the growing cartilage and newly forming bone, though still perceptible, is very irregular. The columnar arrangement of the proliferating cartilage cells is all but lost. The "resting" cartilage zone is poorly preserved. The newly formed bone is fairly well calcified and arranged in irregularly disposed trabeculae of fiber bone. Endochondral (normal) bone formation seems to be at a minimum. The fibrosis of the marrow is now increased.

In the severely advanced stages of this disorder the architecture of the growth zone is very confused (fig. 2). The normal characteristics of the cartilage-bone contact zone are entirely lost. The cartilage plate is very irregular and badly preserved and presents more increased areas of fiber bone and myxoid degeneration. From this zone, large irregularly shaped tongues of more or less degenerated cartilage extend into the bony zone. The arrangement of the newly formed bone trabeculae is confused and presents little of the normal topography. Endochondral bone formation is entirely replaced by the formation of fiber bone, which is undergoing very active transformation. There is active osteoclastic resorption and osteoblastic deposition with a formation of large sheets of lamellar bone and osteoid. There are areas of localized bone necrosis, while other areas present large dilated engorged blood vessels. The marrow is completely fibrous. The impression one gets is that of a completely chaotic arrangement of normally functioning cells interspersed here and there with areas of necrosis and areas of hypervascularity.

CURRENT FORMS OF TREATMENT

With these considerations in mind, one may analyze the various forms of treatment in vogue. There are several conservative methods of treatment of the slipped femoral head, but these concern themselves with the preslipping or very mild slipping stage. Rest in bed with interdiction of all weight bearing will in most instances produce excellent results. One must, however, bear in mind two considerations: that a sudden or gradual slipping may occur even in bed and that the period of rest in bed must extend over several years until the femoral head is definitely fused to the neck. The same considerations hold true for those mild or preslipping cases treated with plaster-of-paris spica immobilization, with traction, or with weight bearing on a well fitting Thomas hip brace.

The manipulative treatment as devised and advocated by Whitman is based on the assumption that this condition "is in reality an incomplete fracture of the neck of the femur. The exciting cause of displacement is apparently a superficial fracture at the superior portion of the junction of the head and neck, or possibly a less direct injury that weakens the immature bony structure on the diaphyseal side of the cartilage. Then follows gradual downward and backward displacement of the head on the neck."[3] His primary indication for treat-

3. Whitman, Royal: A Treatise on Orthopaedic Surgery, ed. 9, New York, Lea & Febiger, 1930, p. 629.

ment is therefore to utilize natural leverage to reduce the deformity. The limb is manipulated into extreme abduction and internal rotation, thus utilizing the impingement of the greater trochanter against the upper rim of the acetabulum as the fulcrum, and the capsule as the force acting on the displaced head to produce a reduction of the deformity.

The results of this method of treatment have on the whole been unsatisfactory, as is evident from the many statistical reports.[4] In mild slippings perfect reductions do not result from these manipulations, even in those instances in which the postoperative x-ray studies show apparent correction of the deformity. The satisfactory appearances are illusory and the results of marked internal rotation, for subsequent x-ray studies in the same position as those in the preoperative studies show that reduction does not occur. This has been pointed out by Mau[5] and is well exemplified in our case 1. Key[4] stated that in advanced cases and in those instances of acute slipping of more than six weeks' duration, manipulation results in the forcing of the neck into the cancellous tissue of the head. Whatever correction is obtained is only apparent, for it is only the result of stretching of the capsule and not the replacement of the head. He further states that with the discontinuance of the fixation the deformity recurs.

In cases in which sudden complete slipping of the femoral head occurs, when treated shortly after the slipping, reduction as a rule is possible by the manipulative method. The early results are usually satisfactory but the late results are often disastrous in that ankylosis or marked limitation of motion supervenes. Later x-ray studies of these cases reveal a diminution of the joint space, irregularities of the outline of the femoral head and evidence of necrosis of the femoral head. In retrospect this is readily comprehensible when the surgeon realizes that no matter how gentle he may be with his manipulations the forces acting on the femoral head are tremendous because of the great leverage exerted through the extremity on a relatively small head, thus resulting in considerable trauma to the head. Furthermore, once the reduction is completed, the possibilities for reestablishment of the circulation of the femoral head are rather meager. One must always consider that in a number of instances the circulation by way of the ligamentum teres, if it has remained uninjured as a result of the manipulation, is insufficient for the nourishment of the femoral head. On the other hand, in those instances in which the ligamentum teres is injured as a result of the manipulation, the circulation is in all probability nonexistent. The only other possible source of blood supply to the head is by way of the distal fragment. This, of course, is shut off by the deranged and excessively thickened epiphyseal plate that remains attached to the diaphyseal side of the neck. Thus, as a result of the various circumstances the possibility for survival of the head uninjured and as a normally functioning part of the hip joint mechanism is rather meager. The truth of this reasoning is well supported by the many end result studies available. The following case is illustrative of the sequence of events here described:

CASE 1.—May D., aged 12 years, seen by one of us (S. K.) in November 1933, had a typical, seemingly mild slipping of the right femoral head. November 10 the right hip was manipulated under an anesthetic. Considerable force had to be used, for it was difficult to overcome the deformity. Despite the use of considerable manual force, the attitude of outward rotation was only partially corrected. She was immobilized in a plaster-of-paris spica and was kept in bed in plaster for six months. She was then allowed out of bed, walking with the aid of crutches, a canvas support for her hip and no weight bearing. She did not bear weight on the affected limb for sixteen months. Nevertheless there was continuously increasing deformation of the head. At the present time, two years after the beginning of treatment, she has no pain; but she has 1 inch (2.5 cm.) of shortening of the limb, a marked limp, and severe restriction of all motions. The last roentgenogram shows great deformity of the head, flattening of its upper surface, and increased density of the head with areas of rarefaction and loss of definition of its articular surface. The upper border of the neck projects upward in the form of a triangular spike beyond the articular surface of the head and even beyond the acetabulum. The articular surface of the acetabulum is irregular in calcification and outline (fig. 3).

Fig. 3 (case 1).—Deformity of head and neck of the femur and irregularity of outline of the acetabulum and areas of sclerosis and rarefaction of the head and neck of the femur, July 2, 1935, twenty months after manipulation.

In cases of marked slipping of prolonged duration, manipulation cannot, on the basis of our operative experience, be effective in reducing displacements, for we have always found the head firmly fixed and displaceable only by means of gouge and mallet. The only possible results of manipulations in this group of cases is the crushing of the head, as is evident from the following case:

CASE 2.—Pearl W., aged 13 years, complained of a deformity of the left lower limb and difficulty in walking, Aug. 25, 1932. She stated that two years previously she fell and sustained an injury. Ever since that time she had had increasing difficulty with the left hip. She was manipulated by a leading orthopedic surgeon and then immobilized in a plaster-of-paris spica for from six to seven months. The result was unsatisfactory. The patient then submitted herself to the care of another orthopedic surgeon, who repeated the same routine.

Examination revealed that she was overweight but in good general condition. She walked with the aid of crutches and a caliper brace on the left side and presented a marked limp on that side. The left lower limb was immobile at the hip joint at 120 degrees of flexion and 15 degrees of adduction. There was shortening of 1 inch. A roentgenogram revealed that the

4. Key, J. A.: Epiphyseal Coxa Vara or Displacement of the Capital Epiphysis of the Femur in Adolescence, J. Bone & Joint Surg. **8**: 53 (Jan.) 1926. Pomeranz, M. M., and Sloane, Marian F.: Slipping of the Proximal Femoral Epiphysis: Therapeutic Results in One Hundred and One Cases, Arch. Surg. **30**: 607 (April) 1935.

5. Mau: Zur Frage der Reposition der traumatischen Epiphysenlösung am Oberschenkelhals, Arch. f. orthop. u. Unfall.-Chir. **24**: 53, 1926.

femoral head was displaced downward in the acetabulum and disconnected from the neck. The upper surface of the neck was displaced upward and was in contact with the upper rim of the acetabulum. The joint space was diminished.

The hip was exposed by one of us (J. B.) through a Smith-Petersen incision. The capsule of the hip joint was found to be immensely thickened. The head and neck were united by thick fibrous tissue. This was severed and the limb was rotated outward. Notwithstanding that the manipulation was gentle, a supracondylar fracture occurred. The femoral head was found to be firmly "frozen" into the acetabulum and could not be budged. The distal surface was therefore curetted and the freshened neck was brought into contact with it. A Steinman pin was then inserted into the supracondylar region. The bone was so soft that the pin was readily passed through the bone without the use of a mallet. The wound was then closed and the limb was immobilized in a plaster-of-paris spica.

The patient made an uneventful convalescence. The end result was an ankylosed hip.

Fig. 4 (case 3).—Slight slipping of femoral head and loss of normal projection at the junction of the upper border of the head and neck, July 17, 1929. The epiphyseal plate is widened, laminated and irregularly calcified and is more oblique than on the opposite side.

This case demonstrates the danger of manipulation and prolonged immobilization in plaster-of-paris spicas. The manipulations produced a traumatic arthritis, which precluded any hope of a mobile joint, while the prolonged immobilization produced a marked atrophy, so much so that a fracture occurred on slight manipulation.

From the foregoing considerations, manipulative treatment in our judgment may possibly be useful and permissible in cases of acute slipping in which the elements of the manipulative reduction are executed deliberately and advisedly with the greatest gentleness. For all other forms the manipulative treatment is inadvisable for the following reasons: 1. The reduction may be impossible. 2. The reduction is often incomplete and illusory. 3. The circulation of the head is likely to be disturbed, as evidenced by late deformity of the head. 4. Traumatic arthritis and even ankylosis may ensue. 5. No change is effected in the pathologic epiphyseal plate.

OPERATIVE TREATMENT

Several operative methods have been devised to attack the deformity at the site of formation. Whitman advised the exposure of the hip joint through an anterior incision and the levering of the head into correct alinement by means of a chisel. The objection to this method is that there is no provision for the removal or the revascularization of the deranged tissue of the epiphyseal plate, which we believe essential to a cure.

Another more conservative operative procedure which has come in vogue for this and other conditions in recent years is that of drilling for the purpose of reestablishing circulation and causing premature ossification of the part. This method is naturally limited to the preslipping or mildly slipping stages. One of us (S. K.) has used this method in several cases with satisfaction. There are two objections to this method: 1. With our present technic one does not know whether the drill holes have actually traversed the epiphyseal plate and entered the femoral head. 2. There is the potential danger of the drill entering the joint, perforating the articular cartilage and introducing osteochondral particles into the joint cavity.

OPERATION ADVISED

It appears to us that successful treatment must include the following: 1. It must be as atraumatic as possible. 2. The deformity must be corrected. 3. The circulation across the epiphyseal area must be reestablished to produce an early fusion between the head and neck of the femur. This can be best accomplished by an operative resection of the epiphyseal plate, realinement and placing in intimate contact the cancellous bone of the head and neck of the femur.

With these points in mind one of us (J. B.) evolved the following technic: Through a Smith-Petersen incision the hip joint is exposed and the capsule is incised crucially. The femoral head is delivered into the wound. The ligamentum teres is disregarded and may be sectioned. The femoral head is then removed *en masse* with a curved chisel proximal to the epiphyseal plate. The epiphyseal plate, which is deformed and wedge shaped, is excised, exposing the healthy bone of the femoral neck. The removed section is wedge shaped, base superiorly and anteriorly. At times the periosteum on the posterior and inferior surfaces of the neck may remain attached both to the head and to the neck so that when the head is elevated it remains attached like a lid. The distal surface of the head is then curetted to remove all remnants of the epiphyseal plate and is shaped to fit the neck. The head is then replaced in the correct position and fixed to the neck by means of an ivory peg inserted through the fovea capitalis. The dislocation is then gently reduced, the capsule is closed with several interrupted sutures, and the wound is closed in layers. The limb is then immobilized in a plaster-of-paris spica in about 30 degrees of abduction, with the patella pointing forward.

The postoperative treatment consists of immobilization for four weeks in the plaster-of-paris spica. This is followed by several weeks in a suspension apparatus to allow mobilization of the hip. The patient is then supplied with a well fitted Thomas hip brace, the utmost care being taken that the weight is borne on the ischial tuberosity, and walking is permitted. No direct weight bearing is permitted until the roentgenogram shows that the femoral head has been completely revascularized as evidenced by smooth, even calcification similar in

density to the surrounding bone. This ordinarily takes about eight months, at the end of which period all restrictions are discontinued.

REPORT OF CASES

CASE 3.—Marvin M., aged 12½ years, admitted to the service of Dr. Samuel Kleinberg, July 20, 1929, complained of pain in the right knee and a limp on the right side. He stated that two weeks previously he was seized with a sudden pain in the right knee while walking. Since then the pain had been moderate but persistent, while the limp had become decided.

The general physical examination was negative, save that the patient was somewhat overweight and that he walked with a marked right-sided limp. The right limb was held in moderate external rotation. Extension at the hip joint was limited at 170 degrees, while all other motions were unrestricted. The right thigh was atrophied three-fourths inch (2 cm.).

Roentgen examination of the right hip in external rotation showed a slight slipping of the femoral head with a loss of the normal projection at the junction of the upper border of the head and neck. The epiphyseal plate was widened and laminated and irregularly calcified (fig. 4). Another x-ray examination of the hip made at the same time, with the limb in internal rotation, did not reveal the slipping noted in the preceding film. The epiphyseal plate, however, showed the same changes previously described.

July [illegible] the limb was manipulated under deep anesthesia and brought into extreme abduction and internal rotation of 45 degrees.

The postoperative x-ray examination showed what appeared to be a satisfactory reduction. August 21 the plaster was removed and the limb was placed in a suspension apparatus for the mobilization of the hip. Further examination August 25 showed that all motions were unrestricted, save extension, which was now limited at 150 degrees. X-ray study at that time in external rotation revealed that the femoral head was not reduced and that its position was similar to that in the corresponding preoperative x-ray study. An open reduction was therefore advised.

Fig. 5 (case 3).—Perfect alinement and firm bony union of the head and neck of the femur Dec. 11, 1935, six and one-half years after operation. The outlines of the articular surfaces are smooth and the joint space is normal.

August 30, the operation outlined was performed by one of us (J. B.). The patient had an uneventful convalescence. One month later the plaster was removed and the limb was placed in a suspension apparatus to mobilize the joint, and physical therapy was administered. Six weeks subsequently, i. e., ten weeks after the operation, the patient was discharged from the hospital walking in a well fitting Thomas hip caliper brace. Examination at that time revealed a complete range of motion at the hip joint, save for flexion, which was limited at 90 degrees.

The patient was then observed in the outpatient department at regular intervals. Six months subsequent to the operation the patient was permitted to walk without the brace for short periods, which were gradually increased, so that at the end of approximately eight months the brace was entirely discarded.

Fig. 7 (case 5).—Slipping of the femoral head, April 19, 1933, before operation.

X-ray studies were made at regular intervals. The one made immediately after the operation showed a satisfactory alinement of the head and neck.

A roentgenogram made Dec. 11, 1935, approximately six and a half years after the operation, showed perfect alinement and union of the head and neck. The articular surface of the head was smooth. The joint space was normal. The neck of the femur was normal in size and conformation (fig. 5).

At that time the patient reported that he was leading an active life, indulging in all athletic activities. He was able to run up the stairs three steps at a time and was not conscious of any disability whatever. He had grown 6 inches (15 cm.) since the operation. There was a complete range of motion at the hip joint, save for flexion, which was limited at 80 degrees, and there was no shortening of the affected limb.

This case is of interest in that it demonstrates the illusion of reduction of the femoral neck by manipulation. The postmanipulative roentgenogram in external rotation gives the same appearance as that noted prior to the reduction with the limb in external rotation, while the postmanipulative roentgenogram in internal rotation gives a similar appearance to that taken prior to the stretching when the limb was in internal rotation. This case also demonstrates conclusively that there is no resultant progressive shortening because of the removal of the epiphysis between the head and the neck of the femur.

CASE 5.—L. D., a girl, aged 13 years, admitted to the Hospital for Joint Diseases in the service of Dr. Kleinberg, April 19, 1933, complained of a limp on the left side and pain in the left hip. In August 1932 she fell from a hammock and on the following day began to experience pain in the left hip and a limp appeared on walking. Ever since that time the pain in the hip joint radiating to the knee was aggravated by activity and relieved by rest. The limp was similarly relieved by rest and aggravated by activity.

Physical examination revealed that the child was somewhat overnourished and was in good general condition, walking with

a marked limp on the left side and holding the limb in external rotation. Internal rotation at the hip joint was limited at the midline. External rotation was unrestricted. Abduction was possible to 20 degrees, while adduction was complete. Flexion was limited at 110 degrees and the limb rotated externally on flexion of the thigh. There was tenderness over the femoral head. Measurements revealed a shortening of the left lower extremity of one-half inch and atrophy of the left thigh of 2¾ inches (7 cm.) and of the left calf of three-fourths inch.

X-ray examination (fig. 7) showed that the left femoral head had slipped downward and backward. There was a rarefaction and widening of the upper femoral epiphyseal cartilage.

April 21, 1933, the left hip joint was operated on by one of us (J. B.). All the details of the technic described were carried out.

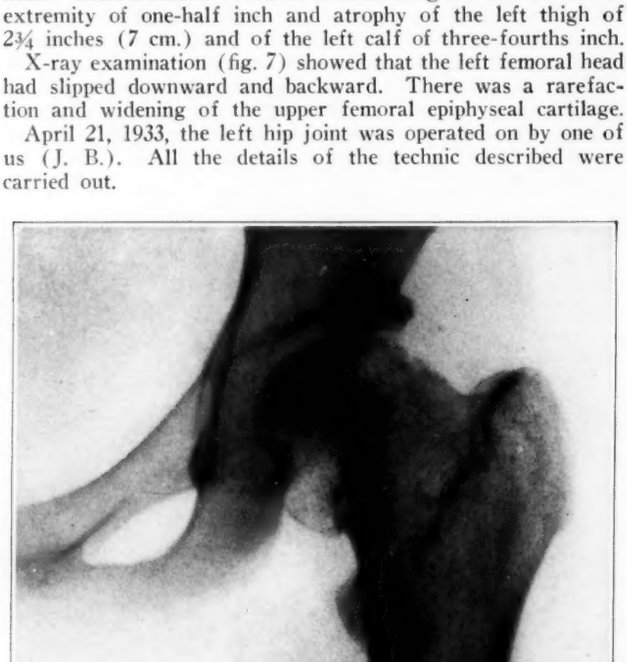

Fig. 8 (case 5).—Complete bony union with normal calcification, joint outlines and joint space Sept. 23, 1935, twenty-nine months after operation.

The postoperative x-ray studies showed a satisfactory alinement of the head and neck of the femur. May 29, five weeks subsequent to the operation, the plaster was removed. Several days later the patient presented a painless range of passive flexion of 150 degrees, abduction of 30 degrees, and a free range of internal and external rotation. Active and passive exercises in a suspension apparatus and baking and massage were instituted. A few weeks later the patient was supplied with a well fitting Thomas hip caliper brace and was permitted to walk for short intervals with the aid of crutches. An x-ray study May 29 showed definite evidence of union between the head and neck of the femur. There were, in addition, resorptive changes in the peg uniting the head and neck of the femur. June 28, nine weeks after the operation, the patient was discharged and referred to the outpatient department.

One month later, June 26, thirteen weeks after operation, there was a complete range of motion and x-ray studies revealed bony union at the operative site. The eight months postoperative x-ray studies revealed that the architecture and ossification of the femoral head were similar to the surrounding bone areas. The patient was therefore permitted to discard the brace gradually. All support was completely removed the thirteenth month after operation. The patient was last seen Dec. 11, 1935, two years and eight months after the operation. At that time she presented a complete range of motion at the hip joint, with no limp and no shortening, notwithstanding the fact that she had grown 5 inches (12.7 cm.) since the operation. X-ray studies September 23, 1935, showed complete union of the capital epiphysis to the neck of the femur (fig. 8).

CASE 7.—Yvette G., aged 8½ years, consulted one of us (S. K.) Aug. 8, 1934, for a right limp. Three and a half months previously, while she was standing on the rear platform of a car, the train started suddenly and she was twisted on her right lower limb. She began limping immediately thereafter. More recently she had a fall which increased the limp and disability. The examination showed that the right lower limb was fixed in flexion of 140 degrees and there was marked outward rotation. There was tenderness to pressure over the front of the hip and severe muscle spasm. A roentgenogram (fig. 9) showed a marked downward slipping of the femoral head.

She was operated on, August 9. The typical operation was performed. A postoperative x-ray examination, September 24 (fig. 10), showed an excellent alinement of the head and neck. The last roentgenogram, made on March 22, 1936, shows fusion of the head and neck with a slight residuum of rarefaction of the upper part of the head, indicating that the femoral head is not as yet completely revascularized and reformed. Clinically the patient presents complete extension, 135 degrees of flexion, 40 degrees of abduction and free rotation. There is no shortening of the limb. She is still under treatment. Weight bearing has not as yet been allowed. It is believed that during the next few months when weight bearing is to be resumed there will be a more complete reformation of the head.

This patient was for special reasons immobilized in plaster for about six months and subsequently was allowed up with crutches without weight bearing. This was complicated by a sudden slipping of the femoral head on the opposite side, necessitating further restriction of weight bearing incidental to the treatment of that lesion. It is believed that the lack of physiologic stimulus resulting from walking on a Thomas hip brace is responsible for delayed reformation of the head.

The philosophy of this operation is based on the assumption that the described approach is the most atraumatic procedure possible, for there are no blind stretchings or manipulations. We further look on the replaced head as a free graft which must be given sufficient time to be revascularized. The approximation of the healthy bony distal surface of the head to a healthy bleeding proximal surface of the neck gives the greatest opportunity for the most rapid healing under the given circumstances. It is because of this that we are most emphatic that there must be no direct weight bearing until the femoral head has been completely reformed, as indicated by repeated x-ray studies. The course of treatment lasts approximately eight months to one year and is well worth the time and effort, in view of the practically perfect result obtainable as shown in our case reports.

CONCLUSIONS

Our experiences and studies of the management of slipped femoral epiphysis have led to the following conclusions:

1. Slipped femoral epiphyses are not fractures in the ordinary sense and therefore cannot be treated as such. This is supported by theoretical considerations as well as by clinical observations.

2. Treatment to be effective should be atraumatic, should correct the deformity and should establish a thorough circulation between the head and the neck of the femur.

3. Treatment in the preslipping or mildly slipping stage may be expectant and should consist of interdiction of weight bearing over a long period of time by rest in bed, preferably, or, if that is impracticable, by the use of a well fitted Thomas hip brace. The proviso must, however, be made that further slipping may occur notwithstanding these measures. In this stage extra-articular drilling of the head and neck may be effective.

4. The most effective treatment for slipped femoral epiphysis, as well as those cases in the preslipping stage, is an operation which assures rapid and permanent healing by the removal of the epiphyseal plate and the direct

contact of the cancellous bone of the head and neck of the femur securely fixed by a bone peg.

5. The operation described has been used in five cases with uniformly good results.

1 West Eighty-Fifth Street.

ABSTRACT OF DISCUSSION

DR. JOSEPH BUCHMAN, New York: I have very little to add, save to emphasize that one must be extremely careful in using this mode of attack that no direct weight bearing is borne until the head is completely revascularized and its structure has been replaced by new bone. Otherwise a traumatic arthritis will develop and a limitation of motion will occur. The operation is based on the principle that by removal of the epiphyseal plate healthy bone is approximated to healthy bone and thus good healing is assured. We regard the head as a free graft and protect it as such from weight bearing. Only under these conditions will one be able to get more satisfactory results.

ROENTGEN THERAPY OF SOME INFECTIONS

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AND
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RICHMOND, VA.

It is our intention to present this paper not as a statistical analysis of a group of infections but as the report of accomplishments and conclusions obtained through seventeen years of experience and observations in the management of various infections.[1] It is hoped that this will bring before the medical profession and emphasize again that irradiation offers a potent ally for proficient and competent treatment in certain infectious states.

A survey of the literature relating to infections and irradiation may be found dated within six years after the discovery of x-rays by Roentgen. In the past twenty-three years numerous writings voice the opinions, theories and enthusiasms of writers both on this continent and abroad. Yet, with a firm theoretical basis and an absence of empiricism, one finds the use of roentgen rays sadly lacking in cases in which they might be of considerable benefit to the afflicted. Careful analysis of this situation discloses the fact that the use of radiation is employed where the radiologist is the best informed in this work and where he has familiarized practitioners in the other branches of medicine with this valuable therapeutic agent in many infections. To offer the patient the utmost that irradiation will give there must be complete and absolute cooperation between the co-workers. The radiologist must share in the responsibility and cannot expect to obtain results if he merely sees the patient, gives a treatment and puts the record of the therapeutic dose in the files to forget from that moment such a patient has been treated by him. Prudent and careful observation, we believe, is the determining factor between success and failure of irradiation in the following acute, subacute and chronic more or less localized infections.

Read before the Section on Radiology at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 15, 1936.

1. Hodges, F. M.: The Roentgen Ray in the Treatment of Carbuncles and Other Infections, Am. J. Roentgenol. **11**: 442-444 (May) 1924; The Roentgen Ray in the Treatment of Local Inflammations, Cellulitis and Carbuncles, J. A. M. A. **85**: 1292-1294 (Oct. 24) 1925; The Roentgen Ray in the Treatment of Certain Localized Infections, South. M. J. **19**: 857-858 (Dec.) 1926; Treatment of Mikulicz's Disease, ibid. **28**: 205-209 (March) 1935; Roentgen-Ray Treatment of Skin Cancer and Allied Conditions, Virginia M. Monthly **53**: 727-729 (Feb.) 1927; The Rationale of Roentgen Therapy in Infections, South. M. J. **23**: 259-263 (March) 1930; Roentgen Therapy of Certain Infections, Am. J. Roentgenol. **35**: 145-155 (Feb.) 1936.

We have arbitrarily grouped various lesions in two classes. These are not compiled according to etiologic or pathologic criteria but are collocated in accordance with their sensitivity or susceptibility to irradiation, complying with our observations and experience.

GROUP 1

1. Early localized erysipelas in adults.
2. Furuncles and furunculosis.
3. Granulomas.
4. Infected hemangiomas.
5. Cellulitis of certain types.
6. Lymphangitis of certain types.
7. Mikulicz's disease.
8. Parotitis.
9. Rhinophyma.

GROUP 2

1. Carbuncles.
2. Blastomycosis.
3. Sporotrichosis.

Group 1 comprises those infections which are sufficiently amenable to irradiation so that we feel no other form of therapeusis is necessary. The lesions under this classification respond so readily that one may predict an immediate amelioration or abortment, followed by rapid regression and healing.

Erysipelas, chiefly the early localized form in the adult, is a commendable example. In this condition irradiation may be considered as a specific. Small early lesions are apt to disappear within twenty-four hours after treatment, requiring no additional therapy. The temperature and toxicity are rapidly alleviated, while the edema and the erythema subside quickly, leaving a wrinkled and exfoliating skin in from thirty-

Fig. 1.—*A*, extensive erysipelas involving most of the face. This lesion was twenty-four hours old, having started on the left side of the face. The patient received treatment April 19, 20 and 21, 1936. *B*, appearance on discharge, April 22, entirely well.

six to forty-eight hours. The dose required is small, from 100 to 150 roentgens (in air), with a voltage of 85 kilovolts of unfiltered rays. Administering this dose well beyond the apparent border of the lesion will prevent further streptococcic permeation of the corium.

Furuncles and furunculosis likewise lend themselves very favorably to the influence of properly applied roentgen rays, although in this instance the invading organism is most frequently a staphylococcus and the natural barrier is more apparent, being evidenced by the induration around the involved hair follicle or sweat gland. The early undeveloped lesion may be

completely aborted in from twelve to twenty-four hours by a dose of unfiltered rays sharply delimited to the local area, while the more advanced lesion will have its course hastened to suppuration and drainage. On the other hand the chronic furunculosis so often seen on the back of the neck and in the axilla is best treated by using filtered rays of from 4 to 6 mm. aluminum equivalent. Here the pathologic condition lies deeper and the connective tissue is more extensively involved. The treatment must be directed at the deeper lying lesions and at the same time toward the newly forming ones. A 125 roentgen, 125 kilovolt, 6 mm. aluminum application at weekly intervals over several weeks has given almost uniformly good results.

The pathologic characteristics of infected angiomas and granulomas make them difficult to treat by other methods, especially when they are situated, which they so often are, where good cosmetic and functional results are desired. Where other forms of therapy have failed,

Fig. 2.—*A*, granuloma treated June 10 and 12, 1935. *B*, patient seen again nine months later, having no recurrence. The scar is soft and there is no evidence of contracture.

irradiation has obtained admirable success. The abundant overgrowth of vascular and cellular tissue forming the tumor-like mass requires a large dose of from 700 to 900 roentgens of unfiltered rays, following which the lesions gradually regress and disappear within two to four weeks, leaving a small, soft and pliable scar. Every single case of this type has responded favorably to roentgen therapy.

Cellulitis of certain types, such as the type seen following an extracted tooth or in instances in which there has been a slight abrasion of the skin and in cases in which no portal of entry or etiologic factor could be determined, yields rapidly to the influence exerted by roentgen rays. The process is limited to the area, the probability of a serious complication is lessened and the reparative process is hastened. The lesions either point rapidly and discharge or gradually subside without evidence of drainage by small doses of from 100 to 150 roentgens of unfiltered rays.

Lymphangitis of certain types regress quickly after they are subjected to a roentgen beam. The red streaks that one sees extending up an extremity radiating from a localized infected area usually disappear rapidly. In the later stage in which the lymphatic channels are rigid and cordlike, with enlarged glands along the course of the system, these can as a rule be made to regress with small doses. When there is not a more or less rapid response to this treatment, of course other measures, such as blood transfusions from a normal or immunized donor or serums, should also be used by a consultant thoroughly experienced in this field.

Mikulicz's disease proper, due to a chronic inflammatory process of the lacrimal and salivary glands, responds more or less permanently to proper roentgen therapy. Differentiating the true Mikulicz disease from the Mikulicz syndrome is often difficult. The latter will also respond to therapy if its pathologic basis is due to one of the blood dyscrasias, such as leukemia, or is a manifestation of a malignant lymphoma, but the results are not permanent. Mikulicz's disease proper to be successfully treated requires larger doses than other inflammatory processes, because the pathologic picture is that of considerable connective tissue production infiltrated by lymphocytes and giant cells plus epithelial degeneration. The most effective dosage ranges around 400 roentgens, 200 kilovolts, 1 mm. of copper and 1 mm. of aluminum.

Parotitis, frequently seen as a complication of surgery of the lower part of the bowel and in patients requiring the presence of jute tubes and tube feedings, usually having a mortality of between 35 and 60 per cent, may have this mortality rate markedly lowered, and the percentage going to suppuration is far less. Whether one uses radium as reported by Rankin and Palmer [2] and Desjardins [3] or the technic of roentgen irradiation that we employ the results are very gratifying, especially when one treats a very sick patient one day where the outcome appears hopeless and finds the same patient the next day sitting up in bed enjoying a meal and talking with his relatives.

In the chronic form that has persisted for months at a time and during which interval there have been numerous exacerbations and drainages, our results have been almost invariably good. In this condition it is not necessary for the patient to undergo repeated incisions with the production of numerous visible scars, and it is not necessary for the surgeon to undertake a difficult operation for the removal of the involved gland, as a series of filtered roentgen rays will produce the desired results, inducing a final result which is satisfactory to the physician and very gratifying to the patient.

The proof of the effectiveness and the ability of irradiation to produce results is readily demonstrated in infected rhinophyma. The pathologic nature of the lesion makes it difficult to manage by other means because the process consists of hyperplastic epithelium, ramified by a number of blood vessels and deeply situated infected glands. The appearance of the individuals and the obnoxious odor ostracize them from social and remunerative contacts. The lesion invariably responds to 300 roentgens of filtered rays and the final outcome is a nose of normal appearance, exhibiting little or no telangiectatic elements and a smooth natural skin. This entity is an ideal one for the radiologist to demonstrate his puissance, as they are quickly turned over by the clinician and is just as easily subjugated by properly applied roentgen therapy.

2. Rankin, F. W., and Palmer, B. M.: Postoperative Parotiditis; Treatment Without and With Radium, Ann. Surg. **92**: 1007-1013 (Dec.) 1930.

3. Desjardins, A. U.: Radiotherapy for Inflammatory Conditions, J. A. M. A. **96**: 401-408 (Feb. 7) 1931.

In group 2 we have placed those infections in which we feel that irradiation is an important auxiliary in the armamentarium for the management of these lesions.

Carbuncles, although very similar to furuncles except for the extensive nature of the process, do not always respond as readily as furuncles. Irradiation alone in most instances limits the spread of the infection, lessens pain, increases drainage, shortens the course of the disease somewhat and undoubtedly, in our experience, lowers the mortality. We feel very strongly that roentgen therapy in combination with heat, especially poultices, offers more than any other form of treatment.

The early carbuncle, treated with a large dose of filtered rays, will often be completely aborted. Incision is rarely necessary. Extension into contiguous structures is impeded or entirely stopped. Carbuncles in later stages are best treated with small doses of unfiltered rays, repeated at short intervals if necessary.

It is surprising to note how soon after treatment the character of the discharge changes. From a watery and scanty exudate it becomes definitely seropurulent and copious, while the tough fibrous nature of the retained material is altered and the floor of the lesion is readily discerned. At the same time the hard induration softens and the multiple small draining sinuses coalesce, becoming one large abscess cavity in which the material readily loosens from the surrounding tissue to be discharged in from three days to a week, leaving a clean freely discharging wound. It is rarely necessary to employ surgical means to obtain a good cosmetic and final result, as the ultimate outcome leaves a smaller and more pliable scar than could be obtained otherwise.

The dermatomycoses, especially blastomycosis and sporotrichosis, are frequently treated favorably and respond well to from 500 to 700 roentgens of filtered rays. Irradiation is supplemented by iodine therapy. On the other hand, many fungous infections of the hands and feet respond admirably to roentgen rays alone, and our best results are seen when the heavier filtration is used. Some radiologists object to the use of the shorter wavelengths on small structures such as the fingers and toes, but where we have failed with unfiltered rays we have been successful with the filtered. Our doses, however, never exceed two thirds of an erythema dose in a single series and therefore we do not feel that we are subjecting the patient to the danger of an obliterative endarteritis or to serious consequences.

COMMENT

Every infection, whether it appears trivial and unimportant or well localized and delimited in the beginning, is a harbinger of potential sequelae such as thrombophlebitis, lymphangitis and pyemia. We feel that irradiation plays an important rôle in diminishing secondary manifestations of the primary lesion. Rarely have we encountered complicating factors, and we are confident that irradiation has contributed much in preventing them.

Experimental data on laboratory animals have shown that, in lesions in which beginning destruction of tissue is taking place, irradiation hastens the disintegration of the tissue in the process of destruction with earlier and more profuse drainage of the area and more rapid recovery.

The changes produced by irradiation are apparently based on the sensitivity of leukocytes, especially lymphocytes, which is well known to radiologists. Heineke [4] has conclusively demonstrated that roentgen rays per se have no subversive effect on pathogenic organisms in culture but that the destructive action which ensues following irradiation is due to a secondary manifestation following the effect of the rays on lymphocytes and leukocytes. In an incredibly short time after subjecting laboratory animals to the roentgen beam he was able to demonstrate lymphocytic changes in direct proportion to the dosage. The phenomenon is characterized by a liberation of chromatin material in the surrounding area. What takes place and what effects follow the manumission of the chromatin is not known. This material collects again and forms in clumps and balls, to be absorbed by adjacent reticular cells and carried away by them as collected material and débris.

Other experimenters suggest the liberation of ferments and the stimulation of antibodies, while some intimate an altered electrocolloidal and metabolic change within the cells.

Fig. 3.—*A*, cellulitis on the left side of the face following a slight lesion in the nose. Treated Jan. 18, 1936. *B*, discharged well, January 22, when the photograph was made.

Different types of lesions and similar lesions in different stages of development react somewhat differently to roentgen rays. This is demonstrated in early carbuncles, in which we have seen rapid dissipation of the infection with these areas returning to normal without necrosis or drainage. The same effect is seen in erysipelas, while in abscesses and in well developed or late stage carbuncles a rapid breaking down of the tissues occurs with an ensuing copious drainage and early healing. The response of lesions is based on the type of disorder present. Lesions with considerable white cell invasion and small amounts of connective tissue are influenced more readily than lesions with much connective tissue and small numbers of leukocytes.

The technic employed is not empirical, but we are not led by a fixed dosage for a certain lesion. Every case is individualized and treated accordingly. It frequently happens that similar lesions receive identical doses, coincidental rather than predetermined. We advocate smaller doses rather than dosages approaching erythemas. Rarely does a lesion receive more than

4. Heineke, H.: Experimentelle Untersuchungen über die Einwirkung der Röntgenstrahlen auf innere Organe, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **14**: 21-94, 1904-1905.

400 roentgens (in air) or two thirds of an erythema dose during a series. The interval between treatments is determined by the lesion and on no other basis. A working rule which is apparently adaptable to most forms of infections may be expressed in the terms of the disorder present; i. e., the greater the lymphocytic and leukocytic infiltration, the smaller the dose with softer x-rays, and the more chronic the condition the larger the dose and the harder the ray.

In cases in which roentgen therapy is an auxiliary in the armamentarium against infection, we insist that if hot dressings are to be applied they be made to fit the lesion and not to include the surrounding area. We feel that the latter produces an unnecessary edema and swelling, especially around the eyes, which can be prevented. When poultices, usually flaxseed, are advised, careful instructions are given that the compress shall not be large and cover only the lesion and not extend beyond. Supportive measures are also utilized when necessary to give to the patient as much comfort as possible. Concomitant systemic disorders are treated as necessary by a consultant experienced in the special field of medicine involved.

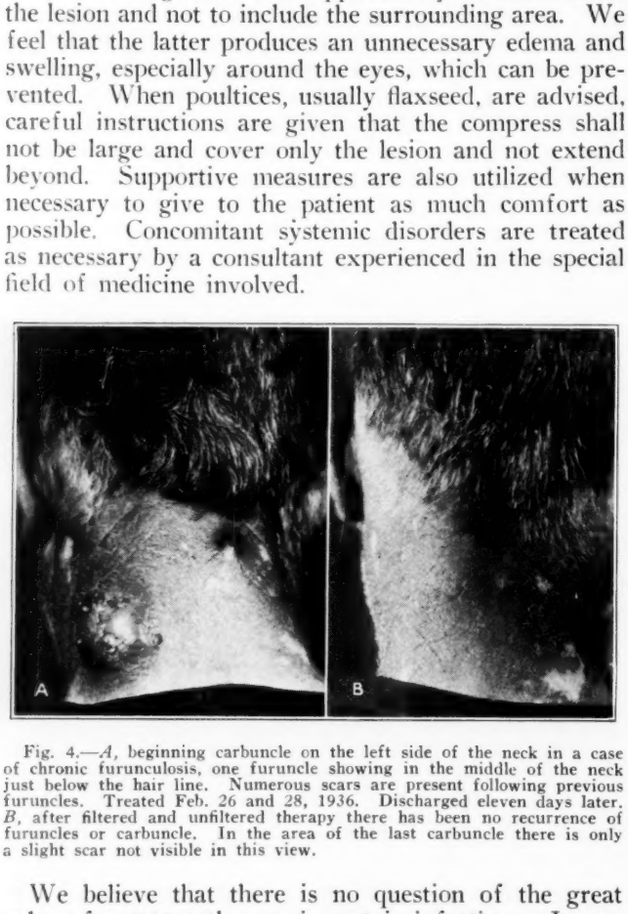

Fig. 4.—*A*, beginning carbuncle on the left side of the neck in a case of chronic furunculosis, one furuncle showing in the middle of the neck just below the hair line. Numerous scars are present following previous furuncles. Treated Feb. 26 and 28, 1936. Discharged eleven days later. *B*, after filtered and unfiltered therapy there has been no recurrence of furuncles or carbuncle. In the area of the last carbuncle there is only a slight scar not visible in this view.

We believe that there is no question of the great value of roentgen therapy in certain infections. In our experience clinicians and surgeons have cooperated fully with us in this work. This method of treatment will, we believe, be generally adopted in many infections when the radiologists throughout the country familiarize the general profession in their respective communities with its value.

1000 West Franklin Street.

ABSTRACT OF DISCUSSION

DR. EDWARD H. SKINNER, Kansas City, Mo.: There are only two situations in which I have any additional points to offer. One is with regard to the treatment of hair follicle infections and furunculosis of the nose, ears and arm pits. I have had cases of these types which have responded beautifully just as Hodges and Berger report. It seems to me this is a nice problem for some ambitious young radiologist. Certain tissue studies are required with cytologic evidence, including the career of these tissues following the x-irradiation.

DR. F. F. BORZELL, Philadelphia: I believe that certain phases of the present status of treatment of infection by radiology require a word of caution. We are all getting beautiful, striking results, but we are at the present moment decidedly empirical. Our results in inflammatory conditions may probably be due to certain cellular influences, perhaps on the reticuloendothelial cells, rather than to any bactericidal effects. This may probably be true in these gangrene cases. It might be well for those who meet an occasional gas gangrene case to use every effort to establish the diagnosis from the standpoint of the organism involved and to make careful clinical records and correlate them. It might be well to refer these records to Dr. Kelly for his continued investigation.

DR. J. JAMES DUFFY, Denison, Iowa: In dealing with the type of staphylococcic infections it has been my experience that if one gives a maximum dose the first time one sees them one has much more success. I saw five years ago a case of Ludwig's angina, the patient having a high temperature and the infection in the neck extending down to the suprasternal notch. There was no evidence of fluctuation and no evidence of localization. Hot packs had been used at home. The patient was in a grave condition. The patient was given a maximum dose at about 104 kilovolts and the next day there was a definite localization. It is most peculiar that better coordination does not exist between the roentgenologist and the surgeon.

DR. L. R. SANTE, St. Louis: With reference to the administration of a large dose of radiation at a single sitting I would say that I am aware that it does not sound reasonable and that it is not done universally. I got into the habit of doing this primarily because I was called on to treat certain carbuncles that were very rapid in their spread. With a feeling of helplessness I crowded the dose and found that it did no harm at all, and the effect was much more rapid. I am at a loss to understand that and cannot explain it. It has been my experience, when the infection is in the fascial planes and not in the skin proper, that the effect is not the same; it is less pronounced. This reaction has always occasioned considerable thought. I have on certain occasions obtained cultures of the organism that produced the carbuncle and have found that radiation applied to the organism in culture does not have any effect at all. This of course is a common observation. Why, then, do the x-rays applied to the organism that is infecting the skin produce a different result? There must be an influence of the rays on the organism, in close intimate contact with the tissue elements, and the result must be due to the development of certain substances in the tissue of the skin.

DR. W. EDWARD CHAMBERLAIN, Philadelphia: I have used carefully calibrated thimble chambers, calibrated at the particular voltage that Dr. Sante has used, against the Bureau of Standards chambers. It was within 0.1 per cent. With eight minutes, 400 milliamperes, at a distance of 16 inches, it was found that various x-ray tubes vary all the way from something like 160 roentgens up to a maximum of about 400 roentgens, more than a hundred per cent variation. The answer is that in this work one must calibrate the beam and must remember that, especially with an unfiltered beam, the variation from one tube to another is tremendous, on account of the wall thickness of the tube. The space charge effects are different, but with the unfiltered beam just the changes from one x-ray tube to another make a big difference. I have demonstrated that a carbuncle will get well very much more quickly with a large dose than with a small dose, but there is an element of danger. I have seen two cases of pyemia that were fatal, following 600 roentgens over a carbuncle, in one case, and 700 roentgens in another. I have not seen the development of pyemia when the smaller doses were used.

DR. LEO G. RIGLER, Minneapolis: In 1924 Platou and I reported a series of fifty cases of erysipelas. It was probably the first list of cases of erysipelas treated with x-rays in this country. We used as a criterion of a good result a drop in the temperature within twenty-four hours after the institution of the x-ray treatment, only one dose being given, and that rather a large one. The dose was not carefully measured, although we thought we were approaching the skin erythema dose, using unfiltered radiation. We used this criterion, the drop in temperature in twenty-four hours, and the number of days that the patient had to remain in the hospital, as compared to a control series, which was entirely unselected. That is, we took the previous year's fifty cases. It appeared evident that one single fairly large dose would have a very favorable effect on erysipelas. It was strikingly illustrated by the fact that the temperature dropped in a high percentage of cases in twenty-four hours. Some time later Dr. Walter Ude, who

succeeded me at the General Hospital in Minneapolis, felt that certain risks were being taken by using x-radiation in large doses, and he changed to the use of ultraviolet radiation. Since then they have collected a large series of cases treated both by x-rays, ultraviolet rays and, independently, serum. It would appear from a critical analysis of their cases that the results with large doses of ultraviolet radiation were as good as with x-rays. The method of choice would certainly be the ultraviolet radiation. It is much more available, the risk is infinitely less, and it is much more easily applied.

DR. SANTE: I am aware that the the output of x-ray tubes changes. It is obvious that the thickness of the walls of different tubes makes a difference in output. But after all, the biologic effect on the skin of the patient always will remain the ultimate criterion of superficial therapy. For skin dosage my associates and I have found for practical purposes that the ordinary factors are perfectly satisfactory for treatment, once the full output of the tube is established. This is checked up at regular intervals by our physicist. At the City Hospital, where we use a machine constructed for higher voltages, the output is smaller; at St. Mary's Hospital the output is greater; but once the output for a tube is measured it remains fairly constant. After all, dosage measured in this way never varies from 90 to 100 per cent, as Dr. Chamberlain's statement might lead one to believe.

DR. ROLLIN H. STEVENS, Detroit: I wonder whether any one has had the experience I have had with cervical parotitis. The few cases that I have treated have responded well when treated in the first twenty-four hours. If those cases run much over twenty-four hours, say two or three days, they go on to suppuration and form retropharyngeal abscess and blood infection, and the patient dies. The patients that it was possible to treat in the first twenty-four hours got well. I refer to a series of seven cases seen last fall. Our setup previous to this series of seven was 100 kilovolts and 4 millimeters of aluminum, from 75 to 100 roentgens at a dose repeated once or twice every twenty-four hours. In the series of seven cases we used 200 kilovolts, 2 mm. of copper and 100 roentgens. We did that, trying to see if there was very much difference in the time factor of treating infections. Of course it probably does not matter whether one uses the short or the long wave, but I do believe that the time consumed in giving a treatment does make considerable difference. We have treated carbuncles in the same way. We have treated them with the long wave and the short wave, with high filtration and low filtration, but using only about 100 roentgens, around 80 to 100 roentgens in either case, either method of treatment, and we find that they seem to do equally well.

DR. WILLIAM H. SARGENT, Oakland, Calif.: I have treated a number of cases of surgical parotitis with x-rays, with gratifying results. None of them were treated within the first twenty-four hours, and yet none went on to suppuration, even though some of the patients were very ill. One patient with extreme swelling recovered more promptly than some of the less ill ones. The dosage in all cases has been from 200 to 240 roentgens, usually given in two doses; occasionally three were used, with an interval of from two or three days between treatments. Three millimeters of aluminum filtration was used, but 1 mm. of aluminum and no filtration has been used with apparently the same results. It has been my impression that in this condition, as well as other inflammatory conditions, suppuration is the result of the stage of the pathologic process rather than any particular feature of the x-ray treatments. It is no doubt preferable to treat these cases early.

DR. R. A. BERGER, Richmond, Va.: In inflammatory lesions we are not governed by a fixed dose in any single instance. Our doses are usually empirical. We have found, however, that the more acute the infection, the smaller the dose. In carbuncle we employ a small dose, rarely exceeding 100 roentgens, with either 4 mm. aluminum or no filter at all. Dr. Hodges has found that treating carbuncles with a massive dose, anything approaching a skin erythema, does what he terms "freezing" the lesion. After receiving such a dose, the lesion usually remains stationary for some time. Although drainage is present, it is not of the copious, seropurulent type obtained with smaller doses. In acute parotitis we have been fortunate in having no cases go on to suppuration.

THE CLINICAL DIAGNOSIS OF PERIARTERITIS NODOSA

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Periarteritis nodosa is more of a pathologic than a clinical entity, and the diagnosis is more frequently made after the autopsy than at the bedside.

Our experience with this condition has led us to the conclusion that it is a manifestation of clinical allergy of so severe a degree that irreversible and destructive lesions occur in the blood vessels and lead to disturbances in the function of the organs supplied by the involved vessels. This opinion is based on the study of the following cases, a review of the literature and an experimental study of induced allergic reactions in man.

REPORT OF CASES

CASE 1.—I. M., a woman, aged 25, was admitted to Mount Sinai Hospital complaining of pains in the arms and legs, swelling of the wrist, elbow and knee joints, itchy red spots on the legs and arms, and asthmatic attacks. The asthmatic attacks had been recurring at intervals of from two to four weeks winter and summer for two years; the other symptoms had been present for two months.

The past history was irrelevant, as there had been no earlier allergic manifestations and no rheumatic fever.

The family history was positive for allergy.

The patient was thin and asthenic, and she appeared to be older than her 25 years. The mucous membranes were pale and showed a slight degree of cyanosis. The eyes, ears, nose and throat showed no significant abnormalities.

The chest was slightly emphysematous in type. The heart was not enlarged; the sounds were clear; there were no murmurs. The lungs were slightly overdistended without evidences of infiltration. Many fine sibilant râles were present.

The abdomen was flat and showed no physical signs of abnormalities of its organs.

The extremities were thin. The wrist, elbow, knee and ankle joints were painful to touch and on motion and were slightly swollen. The skin showed numerous urticarial lesions, many of which were surrounded by areas of hemorrhage. There were also occasional areas of subcutaneous hemorrhage.

Urinalysis revealed a normal urine. The blood contained 12,000 leukocytes and 3,000,000 erythrocytes, with 65 per cent hemoglobin. The differential count showed 30 per cent eosinophils. The Kline test for syphilis was negative. The bleeding and clotting time were within normal limits. The stool showed no ova or parasites. X-ray examination of the chest showed only slight overdistention of the lungs, with an increase in the bronchial markings.

The provisional diagnosis was bronchial asthma, urticaria, purpura and hydrarthrosis of allergic origin; hypochromic anemia.

During a ten day period of hospitalization, the only additional subjective complaint was that of abdominal cramps.

The patient was discharged from the hospital and study from the allergic standpoint was begun. This study revealed positive intradermal reactions to extracts of May fly, house dust, orris root, maple, elm and sorrel pollens. There were suspicious reactions to several foods.

While these studies were being made there was a constant increase in the severity of the joint manifestations and the abdominal pain. There was practically no asthma. Within two weeks areas of hyperesthesia followed by anesthesia were present over the peripheral nerve supplies of both arms and legs, and foot and wrist drop developed. The patient was readmitted to the hospital, where consultations were had with all services that might have been useful. No additional facts

From the Asthma and Hay Fever Clinic and Mount Sinai Hospital.
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of importance were noted. She died on the eighth day of her second hospitalization without a satisfactory clinical explanation of her condition.

Autopsy revealed innumerable severe inflammatory lesions involving the arteries in practically all the organs and tissues of the body. In addition to edema and cellular infiltration of the wall, most marked in the adventitia, many arteries showed severe degenerative and necrotic changes involving one or more

Fig. 1.—Section of skin under low magnification. Normal reaction thirty minutes after injection of histamine, showing congestion, edema and few wandering cells.

coats. The lesions were characteristic of periarteritis nodosa. In places, parenchymatous organs and voluntary muscles showed areas of inflammation.

The most severe arterial lesions were present in the voluntary muscles, liver, gallbladder, heart, lung, alimentary canal and kidneys. The spleen, pancreas, adrenals, bladder and internal genitalia showed less severe arterial lesions than the other organs.

CASE 2.—L. H., a man, aged 31, was seen by one of us (M. B. C.) in consultation with Dr. M. H. Fineberg, Aug. 22, 1932. At that time he had an infection of the upper respiratory tract complicating an attack of bronchial asthma caused by the inhalation of ragweed pollen. He had had attacks of bronchial asthma during the fall hay fever season for ten years. Except for the asthma and the signs of bronchial infection, there were no significant manifestations. The blood pressure was 120 mm. of mercury systolic and 80 diastolic.

In May 1934 the patient returned to Cleveland from his home in New York City. He had not had treatment for his allergy. At this time he presented the picture of marked cardiac failure and was hospitalized. Since the fall of 1933 he had had continuous asthma, which began with very marked conjunctival and moderate nasal symptoms. In November he began to have severe abdominal pain, swelling and pain in various joints and purpuric spots in the skin and subcutaneous tissues. Anasarca developed in March 1934.

Physical examination on admission to the hospital revealed a waterlogged condition, with areas of purpura scattered over the body surface. Except for chronic infection of both antrums, the head and neck showed no abnormalities. Some enlarged glands were palpated in the axillae. The heart was enlarged in all dimensions; there was gallop rhythm; no murmurs were heard. The blood pressure was 200 systolic and 120 diastolic. There was fluid in the chest and in the abdomen. The liver and spleen were both markedly enlarged.

The urine contained albumin. Blood chemical examination revealed nonprotein nitrogen 40, sugar 90, creatinine 2. The Kline test was negative. Blood count revealed 25,000 leukocytes, 81 per cent neutrophils, 6 per cent eosinophils, 5,230,000 erythrocytes and 90 per cent hemoglobin. The electrocardiogram showed a PR interval of 0.22 second with low voltage. X-ray examination of the chest, May 9, 1934, revealed a left pleural effusion.

The provisional diagnoses were malignant hypertension; cardiac failure; Hodgkin's disease; eosinophilic leukemia.

During an eleven day period of hospitalization there was no significant change in the condition and the patient was sent home, where appropriate treatment for the cardiac failure was continued.

It was at this time that one of us (M. B. C.) had the privilege of seeing him again in consultation with Dr. H. H.

Fig. 2.—Section of skin under low magnification. Reaction in a person hypersensitive to ragweed thirty minutes after injection of allergen, showing edema, congestion and eosinophil exudate.

Schweid. In view of our experience in case 1 a diagnosis of periarteritis nodosa was made. Biopsy of a tender area in a muscle confirmed this diagnosis.

CASE 3.—A. K., a woman, aged 27, was admitted to St. Alexis Hospital Aug. 9, 1934, complaining of pain and cyanosis of the left arm, forearm and hand. The condition began three months before admission, with numbness and tingling in both hands. Two days before admission, severe pain developed in the left hand and discoloration followed. Coincidental with

the onset of the symptoms in the arms there was an attack of abdominal pain with vomiting. The abdominal symptoms persisted in mild form. There was a loss of 40 pounds (18 Kg.) during this three months period. Early in adolescence there had been periodic attacks of typical bronchial asthma, and winter cough with occasional wheezing had persisted.

The patient was emaciated. The result of physical examination was essentially negative except for the cyanosis of the

Fig. 3.—Section of bronchus under low magnification. Reversible allergic inflammation (bronchial asthma), mucus, Curschmann's spirals, leukocytes (many eosinophils) in lumen, leukocytic infiltration of mucosa (reversible).

left hand, with beginning gangrene of the thumb and the tips of the index and little finger. The blood count was within normal limits. The urine showed no abnormalities; the serologic tests for syphilis were negative.

A diagnosis of Raynaud's disease was made and a left periarterial sympathectomy was performed. The increase in temperature in this arm was so striking that bilateral cervical sympathectomy was deemed advisable and was performed in two stages a few days later. At the same time the left thumb was amputated and gangrenous tips of the index and little finger were removed.

Within a day or two after the second operation, severe asthma began, and one of us (M. B. C.) was privileged to see her in consultation.

At this time the patient was very asthenic. She was in acute status asthmaticus, which was not relieved by repeated doses of epinephrine.

A consideration of this case led us to explain all the symptoms on the basis of periarteritis nodosa. Death occurred six hours later from bronchial obstruction. Autopsy revealed the typical vascular signs of the disease.

In addition to these three cases we have seen one case at autopsy in which there was a definite history of a bronchial cough with wheezing and have under our care at the present time an asthenic asthmatic woman, aged 33, who has signs of intermittent claudication and severe abdominal cramps. There is diffuse tenderness in the calf muscles, but as yet no nodules have developed that could be removed for histologic study.

CASES DESCRIBED BY OTHERS

Middleton and McCarter [1] have recently reviewed the literature on periarteritis nodosa and have added to the approximately 200 cases in the literature three of their own. They agree with the generally accepted opinion that, while the disease is of unknown etiology, its occurrence in rheumatic subjects justifies its inclusion among the rheumatic diseases. It is pertinent to this discussion that one of their patients had attacks of asthma. Curtis and Coffee [2] described a case in which the diagnosis was made ante mortem from a biopsy and was confirmed at the autopsy table. The history of nasal polyps and asthma in this man was considered incidental and was casually mentioned. These authors have charted the symptoms and signs in thirty-eight cases from the literature, including their own. It is significant that four of the patients had

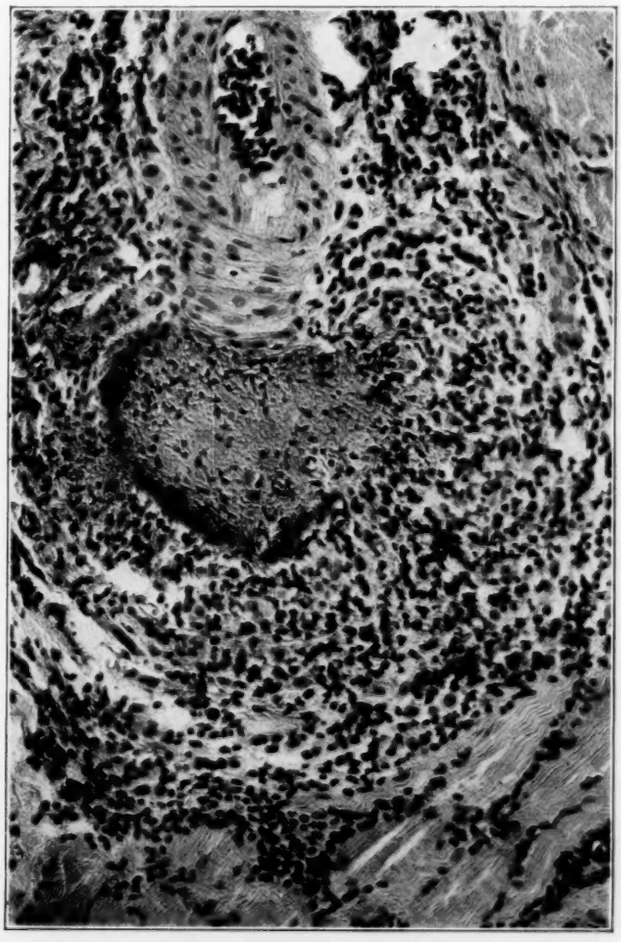


Fig. 4.—Section of voluntary muscle under low magnification. Reversible and irreversible allergic inflammation. Periarteritis nodosa. Degeneration and necrosis of adventitia of artery (irreversible). Eosinophil, mononuclear round cell infiltration (reversible).

sufficiently severe asthma to be called to the attention of the clinician in the presence of more alarming and severe symptoms, and two others had cough. This incidence of asthma is well above that in the general population or among hospitalized patients. Very recently

1. Middleton, W. S., and McCarter, J. C.: The Diagnosis of Periarteritis Nodosa, Am. J. M. Sc. **190**: 291 (Sept.) 1935.
2. Curtis, A. C., and Coffee, R. M.: Ann. Int. Med. **7**: 1345-1358 (May) 1934.

Motley [3] described a case in a man with severe bronchial asthma. The signs were typical but the significance of the asthma was overlooked.

PERIARTERITIS NODOSA AS A SEVERE MANIFESTATION OF CLINICAL ALLERGY

Our conception of periarteritis nodosa as a severe manifestation of clinical allergy is based on the following considerations:

When cells in the allergic state are brought into contact with an antigen to which they are sensitive, a characteristic reaction occurs. This reaction is vascular in nature and results in the outpouring of fluid into the reacting area followed by the extravasation of leukocytes. Reactions vary greatly in severity, depending on the degree of sensitization of the tissues and the doses of the antigen. Most of them disappear without permanent tissue change. For these we use the term reversible. Some, however, are so severe that tissue death results with healing by scar tissue formation. For these we use the term irreversible. The wheal produced by a skin test is an example of a reversible reaction, the Arthus phenomenon is an example of an irreversible one.

Our studies of the histology of induced allergic reactions in man showed that the body response was the same for all plant and animal foreign proteins and histamine, and that the reaction could be identified histologically if examined between thirty and sixty minutes after its inception.[4] The reaction represents inflammation in which the predominating cell is the eosinophil. In some of the more severe reactions there were small areas of tissue necrosis. The Arthus phenomenon is merely an accentuation of this reaction in which there are well defined areas of tissue necrosis associated with areas in which ordinary allergic inflammation is present. Allergic reactions then may be entirely reversible or may represent varying degrees of both reversible and irreversible changes.[5]

If one examines sections of the vessels in periarteritis nodosa, one finds lesions which are indistinguishable histologically from those mentioned. There are areas of scarring alone, areas in which there is only reversible allergic inflammation and every conceivable combination of allergic inflammation and repair.

Cases can be classified into four general types:[6] (1) fever, splenomegaly, leukocytosis, severe anemia, marked emaciation; (2) polyneuritis and polymyositis; (3) renal symptoms; (4) epigastric pain, vomiting and diarrhea. Clear cut types are not seen as often as those in which combinations of symptoms occur, as is well shown in the case histories cited. The most important point in the diagnosis of periarteritis nodosa is to think of the disease. The clinical diagnosis is not difficult to make if the clinician will consider every patient having severe allergy as presenting a potential case of periarteritis nodosa and will watch for symptoms and signs which may be explained on the basis of a temporary or permanent disturbance of the blood supply to any organ. Biopsy of a skin nodule or of a tender area in a muscle will usually confirm the diagnosis, as the histologic picture is characteristic and easily recognized.

10616 Euclid Avenue.

3. Motley, Lyle: Periarteritis Nodosa, J. A. M. A. **106:** 898-902 (March 14) 1936.
4. Kline, B. S.; Cohen, M. B., and Rudolph, J. A.: Histologic Changes in Allergic and Nonallergic Wheals, J. Allergy **3:** 531 (Sept.) 1932.
5. Kline, B. S., and Young, Anna M.: Cases of Reversible and Irreversible Allergic Inflammation, J. Allergy **6:** 247-272 (March) 1935.
6. Lindberg, Kaj: Ein Beitrag zur Kenntnis der Periarteritis Nodosa. Acta med. Scandinav. **76:** 183 (June 12) 1931.

ABSTRACT OF DISCUSSION

DR. HENRY C. SWEANY, Chicago: I would like to ask Dr. Cohen and his associates whether they made a search for sensitization in these cases of periarteritis nodosa and whether they were able to connect that up with the formation of this type of lesion. Also, have they any idea of the connection between this type of phenomenon and that described by Dr. Shwartzman?

DR. MILTON B. COHEN, Cleveland: We have had the opportunity to study several of these patients from the standpoint of allergy. They all give reactions to the common antigens or allergens that are usually associated with clinical allergy. We do not feel that this lesion has any direct relation to the Shwartzman phenomenon. Perhaps all these things are types of hyperimmunity or hypersensitivity, but we feel that that is a peculiar and specific one separate and distinct from the type seen in the Shwartzman phenomenon.

Clinical Notes, Suggestions and New Instruments

NECROSIS OF CORD STRUCTURES FOLLOWING THE INJECTION TREATMENT OF REDUCIBLE HERNIA

STEPHEN A. ZIEMAN, M.D.
Clinical Assistant in Surgery, Rush Medical College
AND
T. M. LARKOWSKI, M.D.
CHICAGO

Current literature directs attention to the injection method for the treatment of reducible hernias. The assurance of freedom from complications, simplicity of technic, and extra-

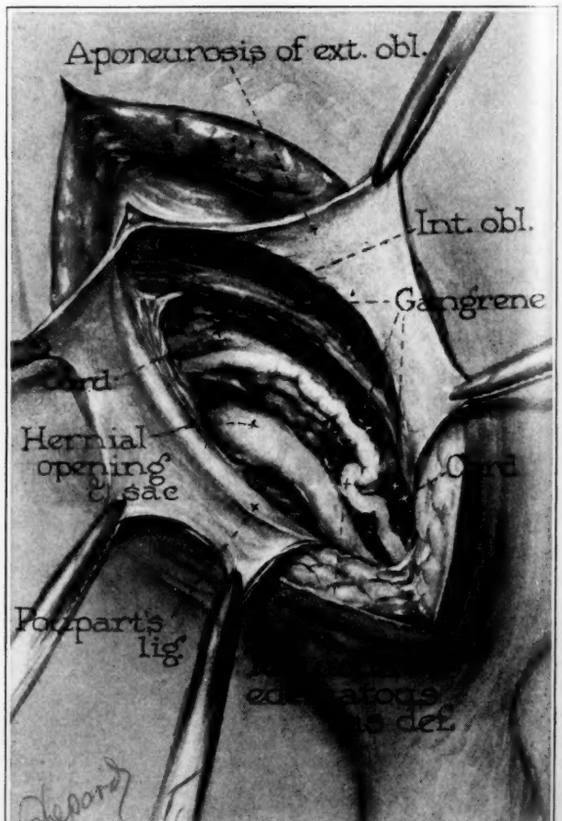


FIG. 1.—Condition disclosed by operation.

ordinarily good end results have stimulated an active interest among the profession.

The following case report, however, will illustrate what may occur when supposedly innocuous material is injected, even by capable hands:

REPORT OF CASE

History.—J. C., aged 28, an Italian, presented himself for operation. The history states that last January while at work he developed a large right indirect inguinal hernia. Gradually becoming incapacitated, he was prevailed on to attend a clinic for an injection treatment. One injection of a tincture of

Fig. 2.—Thrombosis of the blood vessels with necrosis of the adjacent tissue elements.

thuja solution was given into the region approximating the right internal inguinal ring. A truss had been fitted, and the patient sent home with instructions to return for a second injection. That evening, the entire right lower quadrant of the abdomen became discolored. Intense pain developed, which radiated down into the testicle. The scrotum, swollen and painful, confined the patient to his bed, and extreme discomfort forced him to discard the truss. Several days passed before he was able to walk. The ecchymosis and swelling having gradually disappeared, he requested operation.

Two weeks elapsed before it was considered safe to attempt surgical repair. Under ether anesthesia, an inguinal incision was made through the presenting structures including the aponeurosis of the external oblique. All appeared healthy. When the fibers of this fascia were separated, however, and the canal with its contents exposed, a green, gangrenous strip including fibers of the internal oblique and cremasteric muscles, the upper portion of the pampiniform plexus, and the greater part of the cord was found. The vas deferens looked blanched, swollen and tortuous, running directly through the gangrenous appearing spots. The hernial opening situated midway between the internal and external rings as such, and adjacent to Poupart's ligament, offered an unusual position for injection. The sac made its exit here, ascending first under the cord structures, then laterally, following them into the scrotum. A small section of the greenish tissue was removed for histologic examination. The hernial opening was repaired by a purse string suture without opening into the sac; the rent in the transversalis fascia closed, and the aponeurosis of the external oblique imbricated above the cord structures constituted the essential steps of the operation. Convalescence was uneventful, and the patient left the hospital in satisfactory condition ten days later.

Pathologic Report.—A small section of muscle tissue showed marked degeneration of the fibers and absence of nuclei, with necrosis and beginning gangrene. Other sections showed extensive thrombosis of the blood vessels, hemorrhage into the muscle fibers and surrounding tissue, with generalized necrosis.

COMMENT

From the foregoing, it is possible to learn that the repair of hernias by the injection of materials must depend on destruction of the healthy tissue first and subsequent replacement with fibrous tissue; that solutions, however apparently harmless, may cause considerable destructive damage; that thrombosis of the vessels has definitely been observed and proved; that the vas deferens may be pathologically altered; that the pain

Fig. 3.—Destruction of the muscle fibers, absence of nuclei, and gangrene of adjacent tissue elements.

and inconvenience are greater than ordinary herniotomy, and that the site of hernias can be mistaken even by experienced men, and injection fluid impregnated into healthy tissue.

CONCLUSION

Herein is reported a detailed early picture of tissue changes found at operation immediately subsequent to injection of supposedly innocuous solutions for treatment of reducible hernias.

30 North Michigan Avenue.

TUBERCULOSIS AND CANCER

J. K. MILLER, M.D., INGLESIDE, NEB.

A consideration of the interrelation of tuberculosis and cancer presents a mass of contradictory observations. It is generally agreed that tumor cachexia as a nonspecific process will favor the development of tuberculosis, reactivate an old focus or accelerate the course of the disease. However, difference in the age incidence of the two diseases offers little opportunity to exercise such an influence.

That tuberculosis favors the development of cancer is supported by no less an authority than Ewing.[1] In such malignant processes as the leukemias, lymphosarcomas, carcinoma of the

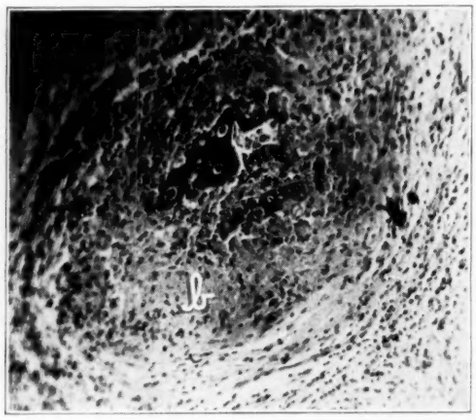


Fig. 1.—The malignant cells in the center of a typical tubercle. High power.

lung and epithelioma on a subsoil of lupus vulgaris, it seems highly probable to Ewing that a tuberculous process is often the excitant. Along the same trend is l'Esperance's work on Hodgkin's disease as an atypical form of tuberculosis. Experimentally, Cherry [2] has found a greater incidence in mice tumors concurrently inoculated with tubercle bacilli. With the exceptions noted by Ewing, it is still debatable whether tuberculosis is a precancerous disease.

Pearl,[3] in a series of 7,500 autopsies, found active tuberculosis twice as frequent in the noncancerous group as in the cancerous class. This greater frequency in the nonmalignant cases is noted also in the necropsy studies of McCaskey,[4] Landis and Broders. However, it must be recalled that tuberculosis takes its greatest toll before the age of 40 and cancer after the age of 40. Contrary to Cherry's work, Centanni and Rezzesi [5] and also Teutschlaender [6] found that tuberculosis hindered the production and retarded the growth of mouse tumors. In general it is admitted that those organs most frequently the recipient of malignant growths are seldom infected by the tubercle bacillus, a fact observed as early as 1841 by Rokitansky.[7]

Cooper [8] has collected 247 cases in which the two diseases coexist in the same organ. Carlson and Bell,[9] from 11,000 general autopsies, find no statistical evidence supporting an antagonism between tuberculosis and cancer. They believe that the relation is incidental. Fischer found that the tubercle bacilli in a tissue culture of Rous sarcoma did not injure the cells that were subcultured many times.

Hueper [10] finds the statistics on hereditary interrelations of cancer and tuberculosis too meager to offer any aid. He observes that the Negro race, while it is especially susceptible to tuberculosis, shows less cancer of the lung than the white race. Eggers,[11] in his review of the etiology of cancer, says: "The validity of the relation [tuberculosis and cancer] would appear to be one that can be settled only by continued and comprehensive statistical study."

The following case of concurrent tuberculosis and cancer of the descending colon is reported as an example of a most intimate association of these two diseases. Cooper has collected forty-nine cases in which the gastro-intestinal tract has harbored cancer and tuberculosis side by side. Of these, four were in the sigmoid colon. Hamperl has reported a series of twenty-two additional cases, of which one was in the colon.

REPORT OF CASE

History.—J. W., a white man, aged 62, admitted Dec. 12, 1932, had pleurisy fifteen years previously. The onset of the present illness was in December 1931 with productive cough, dyspnea and a loss of 18 pounds (8.2 Kg.) during the year. He had suffered from constipation for the past five years.

Physical examination revealed emaciation, medium moist râles in both upper lobes and suppression of breath sounds and dulness over the entire left lung field.

X-ray studies during hospitalization showed productive mottling throughout both lung fields, with an excavation 6 cm. in diameter of the right upper lobe. Sputum was persistently positive. The diagnosis was pulmonary tuberculosis, far advanced B.

The patient was under pneumothorax and rest therapy but became progressively worse and died May 26, 1934.

Autopsy.—There was an empyema of the right side of the chest. The lung parenchyma showed a caseopneumonic tuberculosis of both lungs with cavitation of the right upper lobe.

Scattered throughout the terminal ileum and entire colon were infrequent old tuberculous ulcers. In the midportion of the descending colon was a mass measuring 7 by 6 by 4 cm., which partially occluded the lumen. The walls of the colon were from 4 to 5 cm. thick in the region of the tumor mass. The lymph nodes draining this area and the periaortic chain were enlarged, some being 1.5 cm. in diameter.

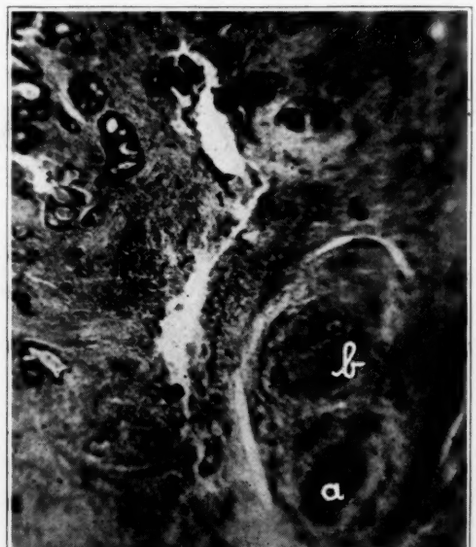


Fig. 2.—Infiltrating cords of cells from the carcinoma of the rectum and two typical tubercles (*a*, *b*), one of which contains cancer cells in its center (*b* and figure 1). Low power.

Microscopic Examination: There was a caseopneumonic pulmonary tuberculosis with associated miliary tuberculosis of the liver, spleen and kidneys. The lymph nodes draining the tumor site showed only typical tubercles.

Section of the colonic mass showed an adenocarcinoma, grade III. The malignant process had invaded the submucosa and muscularis. In one portion, two adjacent tubercles were seen. The one presented the typical histologic features. The center of the other tubercle showed a nest of cancer cells similar to the more anaplastic cells of the main tumor.

1. Ewing, James: Neoplastic Diseases, ed. 3, Philadelphia, W. B. Saunders Company, 1928.
2. Cherry, T.: Lancet **2**: 644 (Sept. 26) 1925.
3. Pearl, Raymond: Am. J. Hyg. **9**: 97 (Jan.) 1929.
4. McCaskey: Am. J. M. Sc. **124**: 97, 1902.
5. Centanni, E., and Rezzesi, F.: Riforma med. **42**: 195 (March 1) 1926.
6. Teutschlaender, O.: Klin. Wchnschr. **8**: 1606 (Aug. 27) 1929.
7. Rokitansky: Handb. d. spez. path. Anat. u. Histol. **1**.
8. Cooper, F. G.: The Association of Tuberculosis and Cancer, Am. Rev. Tuberc. **25**: 108-147 (Jan.) 1932.
9. Carlson, H. A., and Bell, E. T.: J. Cancer Research **13**: 126 (July) 1929.
10. Hueper, W. C.: Tuberculosis and Cancer. Am. Rev. Tuberc. **22**: 271-285 (Sept.) 1930.
11. Eggers, H. E.: The Etiology of Cancer, Arch. Path. **12**: 983-1013 (Dec.) 1931; **13**: 112-150 (Jan.), 296-320 (Feb.), 462-502 (March) 1932.

SUMMARY

Cancer and tuberculosis were found in such intimate relation that cancer cells from an adenocarcinoma of the colon were seen in the center of a tubercle, part of a tuberculous process of the same area. Hueper has observed that some tubercles found in connection with a malignant growth may be pseudotubercles of the cancer stroma and that acid-fast bacilli present are nontuberculous saprophytic organisms. However, the presence of a typical tubercle containing Sternberg-Reed cells, adjacent to the cancerous tubercle, justifies a claim of true tuberculosis. From the literature, little impression of an antagonism between cancer and tuberculosis is gained and their coexistence appears incidental.

Council on Physical Therapy

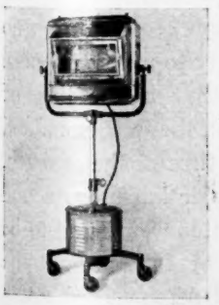
THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

EVEREADY TWO-BED CARBON ARC LAMP, MODEL A-22, ACCEPTABLE

Manufacturer: National Carbon Company, Cleveland.

According to the company, the Eveready Two-Bed Carbon Arc Lamp has been designed to meet the need of the small institution where two adults or four children may be exposed to carbon arc lamp radiation at the same time. It is designed to use different types of carbon electrodes, thereby producing different types of radiation.

The lamp is automatically controlled, the throw of a small snap switch being required for starting and stopping. It is provided with a motor that brings the carbons together, establishes the arc and maintains uniformity until the lamp is stopped by another throw of the switch. The mechanism for controlling and operating this arc is of the same general principle as that used in the Eveready Professional Model and Solarium Lamps.[1] It is adapted for operation on 60 cycle 115 volt alternating current. A transformer is used to secure maximum arc efficiency from the power supplied, the 10 amperes or 1,100 watts drawn from the electrical supply being converted by the transformer to 25 volts at 40 amperes. The lamp requires 1,100 watts; the transformer efficiency is approximately 49 per cent; under two hours' full load the transformer temperature rise is approximately 40 degrees C.



Eveready Two-Bed Carbon Arc Lamp.

The carbon holders in this lamp are so arranged that they use copper coated carbon electrodes 6 mm. in diameter and 9 inches long. Each trim of carbons lasts about two and one-half hours in this lamp. Eveready Sunshine C and E carbons can be used, giving erythema-producing ultraviolet and substantial amounts of infra-red radiation respectively. At a distance of 42 inches with Therapeutic C Carbons, without filter, a minimum perceptible erythema is produced in about four minutes.

Substantial casters are provided so that the unit may be easily transported from place to place. The heavier parts of the lamp are built into the base, thereby giving it stability. The electrical parts of the lamp are constructed of transformer iron, bronze, stainless steel, copper and other materials suited to the functions of the particular parts. The exterior of the lamp is constructed of stainless steel, polished aluminum and chromium. Doors are provided in which one can place wire screens or filter panels or special glass as desired.

This lamp is offered to the medical profession for use in its professional application of carbon arc lamp radiation in the general fields of pediatrics, internal medicine, dermatology and a few other specialized fields.

The unit was investigated in a clinic acceptable to the Council. From a physical standpoint it was found to be not unlike the professional model already accepted by the Council. The evidence presented concerning the spectral energy distribution of the lamp was declared acceptable.

The Council on Physical Therapy therefore voted to accept the Eveready Two-Bed Carbon Arc Lamp, Model A-22, for inclusion in its list of accepted apparatus.

1. Eveready Professional Model Carbon Arc Lamp Acceptable, J. A. M. A. **97**: 462 (Aug. 15) 1931. Eveready Solarium Type Carbon Arc Lamp Acceptable, ibid. **97**: 541 (Aug. 22) 1931.

PROMETHEUS INFRA RED LAMP PORTABLE MODEL #201 ACCEPTABLE

Manufacturer: The Prometheus Electric Corporation, New York.

This unit is recommended for home use on the prescription of a physician. The reflector is 11 inches in diameter and is mounted on a flexible rod that may be adjusted from a height of 35 inches to 66 inches. It has a 13 inch base, telescopic tubes, and the reflector is chromium plated. The burner is of the refractory type with the resistance wires embedded within the ceramic material.

The physical measurements indicate that it requires about 550 watts to operate the lamp.

This unit was tried out in a clinic acceptable to the Council and found to be reliable.

The Council on Physical Therapy voted to include the Prometheus Infra Red Lamp Portable Model #201 in its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

SCARLET FEVER STREPTOCOCCUS TOXIN

(See New and Nonofficial Remedies, 1936, p. 388).

Lederle Laboratories, Inc., Pearl River, N. Y.

Scarlet Fever Streptococcus Immunizing Toxin.—Also marketed in packages of one 2 cc. vial containing 80,000 to 100,000 skin test doses of scarlet fever streptococcus toxin for supplementary treatment of those patients who fail to become Dick negative after receiving the full five dose series of scarlet fever streptococcus immunizing toxin.

SILVER NITRATE (See New and Nonofficial Remedies, 1936, p. 421).

The following dosage form has been accepted:

Ampoule Solution Silver Nitrate 1 Per Cent-Sharp & Dohme: Solution silver nitrate 1 per cent, approximately 0.2 cc., is contained in ampules composed of beeswax. For use, a pinhole is made at one end of the ampule, and after suitable preliminary cleansing of the eye, two drops are placed in each eye of the new-born.

Prepared by Sharp & Dohme, Inc., Philadelphia, Pa. No U. S. patent or trademark.

HALIBUT LIVER OIL (See New and Nonofficial Remedies, 1936, p. 459).

I. V. C. Halibut Liver Oil, Plain.—A brand of halibut liver oil-N. N. R.

Manufactured by International Vitamin Corporation, New York. No U. S. patent. U. S. trademark 314,818.

CASTOR OIL.—"Castor Oil is the fixed oil obtained from the seed of Ricinus communis Linné (Fam. Euphorbiacae)," U. S. P.

For standards see the U. S. P. under Oleum Ricini.

Actions, Uses and Dosage.—See Useful Drugs.

McNeil's Emulsion of Castor Oil (Emulsion Olei Ricini-McNeil's): Castor oil 50 per cent by volume with acacia as an emulsifying agent and sodium benzoate 0.1 per cent as a preservative. Cinnamon is used as a flavoring agent.

Prepared by McNeil Laboratories, Inc., Philadelphia. No U. S. patent or trademark.

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SATURDAY, NOVEMBER 7, 1936

EFFECT OF FAT ON GASTRIC TONUS

The idea that fats retard digestion is an ancient one. Aristotle had evidently observed evidence for this before he expressed the opinion "Now the best digestion is in the bottom of the stomach, because the fat descends not there; such as eat fat meat are very sleepy, by reason that digestion is hindered." This observation has been repeatedly confirmed in more modern studies of gastro-intestinal function. The researches of Cannon [1] are particularly clear in demonstrating the delay in emptying time of the stomach following a fat meal, as compared to the rate of passage of food from the stomach after protein or carbohydrate ingestion. The introduction of x-ray technic made it possible to observe, under normal conditions, both gastric peristalsis and the exit of food through the pylorus. Although the earlier studies emphasized the effect of fat on motility of the stomach and on the control of the pylorus, it was soon demonstrated that fat in the duodenum is of profound importance in influencing gastric tonus. In his classic work on hunger, published in 1916, Carlson [2] observed that oil as well as other substances introduced into the small intestine inhibited gastric hunger contractions and gastric tonus. This observation has been substantiated and expanded, notably by the researches of Ivy and of Lim.[3] These investigators have conducted numerous experiments, the results of which are interpreted to indicate that a humoral mechanism is responsible for the inhibition of gastric motility. They suggested that the inhibitory substance is for the most part present in normal intestinal mucosa in an inactive state and that after exposure to oil a certain proportion of the inactive substance is activated. The name "enterogastrone" was proposed for the agent. Intravenous injections of extracts of this substance, prepared from the upper part of the small intestine, inhibited gastric motility in dogs.

A major portion of the experiments designed to study factors influencing gastric tonus have involved surgical technic of various types, usually applied to the stomach. This is particularly true of attempts to determine the possible importance of a nervous mechanism or of the pancreas in modifying the motility of the stomach. It has been desirable to investigate this question by a method in which the stomach and its nerve supply are undisturbed by any surgical procedures and which produces as nearly normal physiologic conditions in the stomach as possible. This goal has been achieved recently by Waugh,[4] and his data therefore assume added significance. This investigator worked with trained animals under controlled conditions and by means of fluoroscopic examination determined the time of appearance of the routine barium sulfate meal in the duodenum and the emptying time of the stomach. The preparation of a jejunal fistula made it possible to study the effect of various materials introduced into the jejunum on gastric motility and emptying. Under proper care of experimentation, fairly uniform and consistent results could be obtained for the time required for the barium sulfate to appear in the duodenum and for the period necessary for the emptying of the stomach. Physiologic solution of sodium chloride in the jejunum had little effect on gastric motility and emptying. However, the introduction of fat in the form of undiluted cream into the jejunum immediately produced marked atony of the whole stomach with no peristalsis for periods of from thirty to ninety minutes. This resulted in a considerable delay in the time of appearance of the barium sulfate in the duodenum and in a prolongation of the emptying time of the stomach. A study was also made of the gastric inhibitory action of fat placed in the stomach, and this was found to be much less pronounced than that of fat put into the jejunum. In the latter study, fat administered orally appeared to be without effect until it had reached the upper part of the small intestine.

The experimental results of Waugh permit the conclusion that the site of initiation for the gastric inhibitory mechanism is not in the stomach but in the upper part of the small intestine. The main mode of action is apparently an atony of the stomach with an absence of peristalsis, although an actual closure of the pylorus may also be concerned in the gastric inhibition produced by fat. It seems evident that a similar technic may be employed for the assay of various materials prepared from duodenal tissue and should be of considerable aid in further purification and chemical studies of the apparent humoral agent activated by fat and of importance in the regulation of gastric tonus.

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2. Carlson, A. J.: The Control of Hunger in Health and Disease, Chicago, University of Chicago Press, 1916.
3. A summary of the results of research on the subject of gastric motility is given by Lim, R. K. S.: Observations on the Mechanism of the Inhibition of Gastric Function by Fat, Quart. J. Exper. Physiol. **23**: 263 (Aug. 10) 1933.
4. Waugh, J. M.: Effect of Fat Introduced into the Jejunum by Fistula on Motility and Emptying Time of the Stomach, Arch. Surg. **33**: 451 (Sept.) 1936.

PROBLEM OF NUTRITION

The committee of the League of Nations[1] formed to investigate the problem of nutrition found the subject too extensive for the presentation of a comprehensive report to the 1936 assembly of the league. The preliminary report of the committee consists of four volumes: 1. An Interim Report of the Mixed Committee on the Problem of Nutrition, embodying the suggestions made by the committee to the assembly and giving a general idea of the problems involved. 2. A report on the Physiological Bases of Nutrition, drawn up by the Technical Commission of the Health Committee and forming the starting point of the scientific aspect of the nutrition problem. 3. A Report on Nutrition in Various Countries, which gives the substance of the actual data received by the committee, including the essential portion of the information contained in the replies of certain governments to the secretary-general's circular letter of Nov. 30, 1935, and the available statistical material concerning the consumption of foodstuffs. 4. Statistics on Food Production, Consumption and Prices. The first two volumes are now available. The first volume contains a general survey of the nutrition problem, including some of the latest dicta regarding optimal and minimal standards of human diet. The specific problems of child health, general and professional education, economic considerations, the agricultural and national nutrition policies and social welfare are discussed in the first chapter. The special dietary needs of different classes and age groups, including expectant and nursing mothers, infants, children of various ages and adults, are considered briefly in the second chapter. Energy requirements and the specific rôle of various foodstuffs in the dietary form the subject of considerable discussion. Perhaps the most important conclusion was that milk is the nearest approach to a perfect and complete food and that no other single food is known that can be used as a substitute. Since, however, different foods are available at lower costs in some areas than in others, the possibilities of substitutions are important. Concerted international action would greatly stimulate the development of rational nutrition. An enormous mass of information on nutrition is available in the world, but it is fragmentary, heterogeneous and frequently devoid of scientific basis. In short, the conclusion is obvious that the gaps between general knowledge on nutrition and the application of this knowledge in legislative practice are wide. The main problem is to bridge this gap.

A number of recommendations are made in this report, including the encouragement and support in every possible way of further scientific study of nutrition problems, vigorous policies of education in public nutrition, special consideration of the means of meeting the nutritional needs of the lower income sections of each community, the setting up of standards of reference and specifications for grading food according to quality, and consideration of the degree and method by which national supplies and consumption of individual foods might be improved.

The analysis of the physiologic bases of nutrition, contained in the second volume of the report, results in the following general recommendations: 1. Although a simplified diet may be so constituted from a few protective foods as to be satisfactory, it is a general principle that variety in diet tends to safety, provided it contains a sufficiency of the protective types of food materials. 2. Since white flour in the process of milling is deprived of important nutritive elements, its use should be decreased and partial replacement by lightly milled cereals should be encouraged. 3. Milk should form a conspicuous element of the diet at all ages. 4. Fresh vegetables and fruits should always be constituents of the normal mixed diet. 5. The need for provision of extra vitamin D wherever and whenever sunshine is not abundant is especially emphasized.

1. The Problem of Nutrition: Vol. 1. Interim Report of the Mixed Committee on the Problem of Nutrition. Vol. 2. Report on the Physiological Bases of Nutrition. Distributed by World Peace Foundation, 8 West Fortieth Street, New York.

MASKED ALLERGENS

The protean manifestations of the allergic state and the apparent infinitude of substances to which the human being may become sensitized have made us more conscious of the importance of knowledge in this field. Reports of new agents as sensitizers are encountered with increasing frequency. Recently a starch-splitting enzyme has been shown to be the causative agent in untoward gastro-intestinal symptoms following its administration. Certain constipation correctives of plant origin produce similar results. Many of these events cannot be foreseen. When products already marketed and of known composition are concerned, much needless inconvenience and not infrequently even dangerous reactions may be avoided by investigation previous to use. The more adequate labeling of these materials will prevent much unnecessary distress. No group of individuals is more aware of its environment, is more careful of its food, its drugs, its very milieu, than those who are allergic. Unless forewarned by their physicians or by the label of the manufacturer, these otherwise conservative and wary folk must learn by grievous experience. It makes considerable difference whether vitamin preparations (now in seasonally increased usage) are put up in fish oil, maize oil or peanut oil. The palatability and digestibility of potato chips may depend entirely on whether they are cooked in lard, cottonseed oil or linseed oil. The small fraction of wheat in a supposed "all-rye" bread may spell the difference between a happy or a miserable few hours. The unlabeled bromide sedative, phenolphthalein laxative or iodide compound may cause more discomfort than the conditions they allegedly correct. The memory of any practitioner could multiply these examples many times.

Proper labeling of such commodities should set forth not only their principal ingredients but every substance contained in them or of significance in their preparation. The ready response of the public to such a plan would be manifested by the increased use and prescription of products so marketed. There would be no need for compulsion to bring the usual stand-patters and conscientious objectors into line, for, once the advantages of such a program were seen, they would be quick to follow, and an informed public would enjoy the benefits of this new protection.

Caveat emptor was never meant to apply to the purchase of commodities that affect the health of a nation. The need for such a warning will automatically disappear with the unmasking of our commercial labels. Education and experience have made the allergic patient cosmetic conscious, food and drug conscious, and household conscious. To remove the cloak of obscurity from articles in common use is a decided step toward making self preservation less difficult for an increasingly large proportion of our population.

Current Comment

INEFFECTIVENESS OF CONTRACEPTIVE METHODS

The reproductive life histories of 30,949 women form the basis for a recent report by Pearl.[1] Of the white women in the sample, 10,806, or 42.7 per cent, and of the Negro women 925, or 16.4 per cent, had practiced contraception up to the time of record. An analysis of the mean and median age of women not practicing contraception, married only once and having no form of gynecologic disease, shows that under these conditions the median pregnancy rates of white and of Negro women are identical in each quinquennial age period of exposure to the risk of pregnancy. The same is true also for the age specific mean pregnancy rates, except for two age periods in which the racial differences are probably statistically different. The analysis of the age specific mean and median pregnancy rates of white women practicing contraception regularly and steadily throughout their married lives, without intermission of any sort, married only once and free of gynecologic disease, showed that this type of contraceptive practice led generally to a reduction of median pregnancy rates below those of noncontraceptors in the same age period. This reduction in pregnancy rates, however, averaged only from 20 to 30 per cent. This low average may probably be interpreted as an expression of the relative lack of intelligence and effectiveness of these women with the methods employed. Among Negro women in the same category the reduction of pregnancy rates was insignificantly slight. The latter fact demonstrates the extremely inexact nature of ordinary birth control methods when employed by Negro women.

1. Pearl, Raymond: Third Progress Report on a Study of Family Limitation, Milbank Memorial Fund Quarterly **14**, July 1936.

CULTURAL METHODS FOR THE DIAGNOSIS OF GONOCOCCIC INFECTIONS

Many mediums and procedures have been described for the cultivation of Neisseria gonorrhoeae since Bumm in 1885 first successfully grew the organisms on coagulated human serum. Difficulty heretofore has been experienced in isolating the gonococcus from purulent discharges teeming with other species of bacteria. Most significant information on the growth requirements was contributed by McLeod and his associates[1] in England. They observed that autoclaved peptones inhibited the growth of the gonococcus but that by incorporating heated blood in the medium this untoward effect was eliminated. The British investigators also proved that a reinforcement of the atmosphere with approximately 10 per cent carbon dioxide favored the isolation of the organism, while such an atmosphere was unnecessary to propagate stock strains. In this country, Leahy and Carpenter[2] not only confirmed these observations but reported that 15 per cent of the strains of gonococci failed to grow unless the atmosphere in which the cultures were incubated contained 10 per cent carbon dioxide. Furthermore, they observed that the temperature of incubation was an essential factor in the routine isolation of cultures. Some races failed to grow at 37 C. but developed at 34 C., and vice versa. This information suggests that more positive cultures may be obtained when lower temperatures, such as 35 or 36 C., are employed. Another most useful adjunct to the cultural method is the "oxydase test" described by Gordon and McLeod.[3] It is used to identify colonies of Neisseria in mixed cultures and is especially valuable in differentiating such colonies from those of streptococci and diphtheroids, which macroscopically appear very similar. Several workers[4] in this country and abroad have reported that by its use in conjunction with the cultural method from 15 to 50 per cent more positive diagnoses were made than by the examination of stained smears for gram-negative diplococci. The cultural method also serves as a reliable test for cure, in which rôle it is perhaps of greatest value. Its use overcomes the difficulties encountered in examining smears in chronic cases of gonorrhea when secondary infection has changed the clinical picture and few gonococci are present in the inflammatory exudate. The isolation of Neisseria gonorrhoeae therefore removes the shortcomings of the "smear" method and renders an unmistakable diagnosis. Furthermore, it constitutes medicolegal evidence that is acceptable in court. Although further research will undoubtedly contribute toward the simplification of the cultural method and make it more practical, the more extensive use of the present procedure in public health laboratories will immeasurably aid in the control of gonococcic infections.

1. Gordon, John, and McLeod, J. W.: J. Path. & Bact. **29**: 13 (Jan.) 1926. McLeod, J. W.; Wheatley, Bertha, and Phelon, H. V.: Brit. J. Exper. Path. **8**: 25 (Feb.) 1927.

2. Carpenter, C. M., and Leahy, Alice D.: J. Bact. **29**: 36 (Jan.) 1935. Leahy, Alice D., and Carpenter, C. M.: Am. J. Syph., Gonor. & Ven. Dis. **20**: 347 (July) 1936.

3. Gordon, John, and McLeod, J. W.: J. Path. & Bact. **31**: 185 (April) 1928.

4. Spohr, C. L., and Landy, Maurice: J. Lab. & Clin. Med. **21**: 650 (March) 1936. McLeod, J. W.; Coates, J. C.; Happold, F. C.; Priestley, D. P., and Wheatley, Bertha: J. Path. & Bact. **39**: 221 (July) 1934. Price, I. N. O.: Brit. M. J. **1**: 199 (Feb. 2) 1929. Carpenter and Leahy.[2] Leahy and Carpenter.[2]

Medical Economics

MEDICAL AND HOSPITAL CARE FOR DEPENDENT FAMILIES

A Government Problem as Met in the City of Rochester, N. Y.

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ROCHESTER, N. Y.

Medical care of the indigent as a government obligation in the past few years has become an increasingly greater problem. This is due to two factors: (1) the large increase in the numbers who are not able to purchase their medical needs, and (2) the increasing inability of private agencies to supply the necessary medical needs.

The old state Poor Law, which was in effect until 1930, was rather vague with reference to medical care. Medical care, while implied in the old Poor Law, was not definitely mandatory. The Public Welfare Law of 1930 under article IX, section 77, however, definitely states that "It shall be the duty of public welfare officials, insofar as funds are available for that purpose, to provide adequately for those unable to maintain themselves. They shall, whenever possible, administer such care and treatment as may restore such persons to a condition of self-support, and shall further give such service to those liable to become destitute as may prevent the necessity of their becoming public charges."

Article X, section 83, as later amended and effective April 25, 1935, made the responsibility of the public welfare districts for providing medical care, not only for persons unable to provide such care, but also for persons not otherwise in need of relief. Section 83 reads, "The public welfare district shall be responsible for providing necessary medical care for all persons under its care, and for such persons otherwise able to maintain themselves, who are unable to secure necessary medical care. Such care may be given in dispensaries, hospitals, the person's home, or other suitable place."

In order to provide for such care, the welfare district is empowered under section 84 to appoint physicians to care for sick persons in their homes. "In a county welfare district such physician or physicians shall be appointed by the county commissioner. In a city such physician or physicians shall be appointed in accordance with the provisions of the general or local law, relating to such city. In a town, such physician shall be appointed by the town board. Where no physician or physicians is so appointed, the public welfare official shall employ a physician or physicians to visit sick persons in their homes whenever necessary."

Under section 85 the present Public Welfare Law makes counties and cities responsible for providing hospital care. Under the old Poor Law, towns provided hospital care but now have no responsibility for such care. The law also provides a definite procedure for securing acceptance as public charges in emergency cases. These cases are of increasing importance. The old Poor Law made no provisions and had no procedures for this group. Under the foregoing laws the principle is definitely established that the state, through its various political units, has a definite obligation to provide not only food, shelter and clothing but also medical care to those in need.

As relief increasingly became a major problem in the past few years, the state through the Temporary Emergency Relief Administration stepped into the picture to share in the cost and make possible a fuller and more adequate service than was possible through unassisted local funds.

The Emergency Relief Act setting up the Temporary Emergency Relief Administration was passed in 1931. As amended in 1933 it reads as follows: "'Home Relief' means shelter, fuel, food, clothing, light, necessary household supplies, *medicine, medical supplies,* relief to veterans under existing laws *and medical attendance furnished* by a municipal corporation or a town, where home relief is a town charge, to persons or their dependents in their *abode or habitation* whenever possible and does not include old age relief or allowances made to mothers for the care of dependent children or *hospital or institutional care.*"

The state, then, through the Temporary Emergency Relief Administration does not participate in the cost of hospital or institutional care and furthermore under its regulations will not approve claims for expenditures by municipal corporations in cases:

"1. Where necessary hospital or institutional care has not been provided, or has been unduly delayed; and

2. Where full use has not been made of all existing public facilities for providing free medical services."

To provide for the orderly administration of its activities, the Temporary Emergency Relief Administration has set up rules and regulations under which it functions. On March 3, 1933, the Temporary Emergency Relief Administration adopted "'Rules and Regulations Governing Medical Care to Home Relief Clients' in the form approved by the Special Temporary Emergency Relief Administration Advisory Committee of the Medical Society of the State of New York, and the State Commissioner of Health." These are the rules and regulations revised from time to time, the last revision being in March of this year and in effect April 1, 1936, under which medical care is administered in the various political units of the state so far as the state assumes the responsibility for medical care.

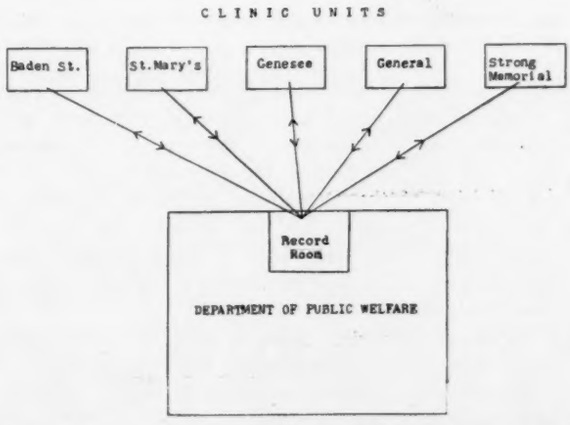

Chart 1.—Contact between clinic units and record room of Department of Public Welfare. Direct telephone connections for verification of status of case.

With the preceding as a general background, the facilities and regulations created in the city of Rochester to meet the problem of medical care of the indigent may now be discussed.

The private hospitals in the city of Rochester had been operating for the past several years with increasing deficits over and above allotments made by the Community Chest. In response to the needs of the hospitals, it was determined in consultation with, and with the approval of, the State Department of Health and the Temporary Emergency Relief Administration, to institute an experiment whereby the hospitals would be reimbursed for clinic care given to the Department of Public Welfare clients in the outpatient departments of the hospitals.

For the two fiscal years April 1933-1934 and April 1934-1935 the combined operating deficits of the four private hospitals participating in the Community Chest respectively were in round numbers $200,000 and $225,000. In each year the Community Chest granted these hospitals about $157,000, with a resulting net deficit of about $42,000 and $69,000 for the respec-

tive years. The respective figures for 1935-1936 were $222,000, $182,000 and $40,000. In recognizing that it is a municipal obligation to pay for the medical needs supplied to the clients of the Department of Public Welfare by these hospitals, just as the Department of Public Welfare pays for the food, shelter and clothing supplied to its clients, it was expected that these deficits, either in full or in a large part, would not recur.

As a by-product of the need for medical direction and supervision for this particular activity, the municipal authorities

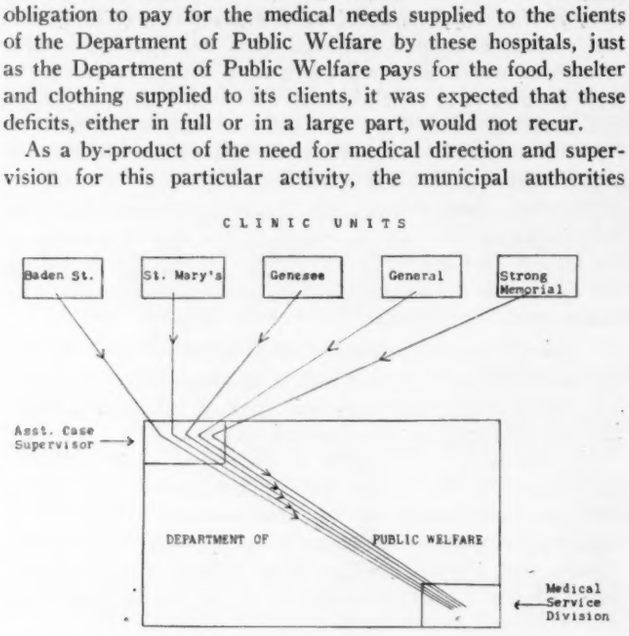

Chart 2.—Routing of medical supply forms from clinic units to Medical Service Division.

deemed it desirable to consolidate the entire question of medical care to the indigent, including medicines, medical supplies and hospitalization, with this outpatient program. I was requested in June of last year to take over the directorship of the Medical Service Division of the Department of Public Welfare with that end in view. A medical unit had existed in the Department of Public Welfare. Its supervision of these medical activities, however, because of the lack of competent medical advice, was not considered adequate.

An analysis of the medical needs of clients of the Department of Public Welfare and of individuals otherwise indigent indicated the following desirable activities in such a division of the Department of Public Welfare.

1. Medical care supplied in homes of patients and offices of physicians.

2. Dental care—treatments, extractions, repairs and dentures.

3. Clinic care in outpatient departments of hospital or dispensary.

4. The supplying of medical needs, such as:

(*a*) Medicines on prescriptions.

(*b*) Medical appliances; eyeglasses, orthopedic needs, special belts, braces, corsets and shoes, and so on.

5. Hospitalization:

(*a*) Private hospitals.

(*b*) Municipal hospital.

(*c*) County hospital.

6. Placement of individuals in:

(*a*) Monroe County Home.

(*b*) Private homes.

Let me briefly dispose of several of these simpler problems and then take up more fully the major problems, such as arrangements for medical care through the dispensaries, the supplying of medical needs and the large question of hospitalization.

Medical care in the homes of patients and the physician's office is furnished through a staff of about twenty city physicians working under the supervision of the Health Bureau. These physicians also have responsibility for medical activities in the public schools. Requests for such services are made at the Medical Division. The requests are then passed on to the Health Bureau. There are no provisions in accordance with the Public Welfare Law for payment for medical care to private physicians.

Dental care is provided through the dental clinics of the dispensaries and several dentists located in different parts of the city, in accordance with the regulations and schedules of the Temporary Emergency Relief Administration.

Admission of individuals into the County Hospital and Home, either direct or on transfer from a general hospital, is arranged for through the office of the County Commissioner of Public Welfare.

The problem of assuming financial responsibility for clinic care for families on the relief rolls of the Department of Public Welfare was a new project, something in the nature of an experiment. This demanded the creation of an organization and the formulation of regulations, schedules and procedures.

Five clinics were selected, four attached to hospitals and one unattached dispensary in a section of the city without a hospital. One clinic having less than 20,000 visits a year was not included. In each of these five clinics was established a unit of the Medical Service Division consisting of a trained social service worker with medical experience or a graduate nurse with social service experience and one or two clerical aids, depending on the size of the clinic. The units were opened successively, from four to seven days apart, beginning with the smallest. The first unit was opened with two staffs; one, which remained at the first clinic and the second, which was utilized as a traveling training unit for each of the succeeding units. Each succeeding clinic was then opened with its unit and the training unit. When this training unit arrived at the fourth clinic, the staff for the fifth and last clinic was also brought into the fourth unit for its training. A direct telephone connection was established from each unit to the record room of the Department of Public Welfare for the verification of the statements of patients who claim to be on the relief rolls of the Department of Public Welfare. Records are maintained of each patient, with daily and monthly reports on the work of each clinic.

Regulations and procedures governing the authorization of patients as a city charge, the authorization of expensive medica-

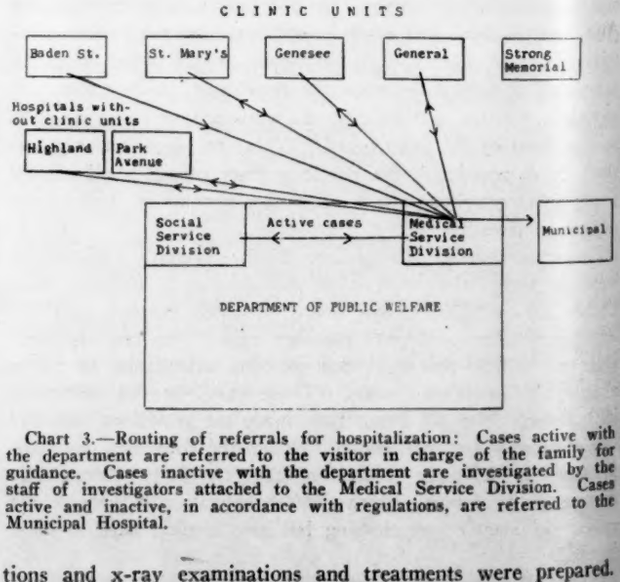

Chart 3.—Routing of referrals for hospitalization: Cases active with the department are referred to the visitor in charge of the family for guidance. Cases inactive with the department are investigated by the staff of investigators attached to the Medical Service Division. Cases active and inactive, in accordance with regulations, are referred to the Municipal Hospital.

tions and x-ray examinations and treatments were prepared. These were discussed at a conference with representatives of the clinics and had their approval. With but minor changes, these regulations and procedures are in use at the present time.

A fee of $0.50 is paid by the department for each clinic visit. All medication costing the clinic less than $0.50 is supplied without any additional charge. An authorization includes visits

to all clinics to which the patient may be referred on the day of authorization, including physical therapy, the usual laboratory tests and ordinary surgical dressings. Expensive drugs, costing more than $0.50, x-ray examinations and other medical needs are separately authorized. The care of acute and chronic cases is regulated in accordance with the procedures established by the Temporary Emergency Relief Administration.

The schedule of costs for expensive medication, x-ray examination and therapy is a schedule approved by the Temporary Emergency Relief Administration.

Because of anticipated other provisions, the care of venereal disease is not authorized through this set-up. Because of the existence of other facilities neither prenatal nor postnatal, well baby and tuberculosis clinics are authorized.

The amount paid to the hospitals for this service to welfare clients over the period from July 1, 1935, to Jan. 1, 1936, was $37,174.82, approximately one half of the combined hospital deficits of the previous year. However, this income is offset by an additional expenditure on the part of the clinics for medication supplied to these patients. This innovation of payment to the hospitals for clinic care given to clients of the Department of Public Welfare is an experiment. How long it will continue with state aid, or at all, we do not know.

MEDICAL SUPPLY NEEDS

In order to conform with rules and regulations governing medical care as issued by the Temporary Emergency Relief Administration, which of necessity conform with regulations of the Federal Emergency Relief Administration, it is necessary to supervise with considerable care all requisitions that come to the Medical Division for medicines, medical supplies, dental work, orthopedic supplies, special shoes, eye glasses, corsets, belts, trusses, and the like.

This supervision is indicated both in the interest of economy and with the view of securing state reimbursement. Reimbursement can be secured only as our procedures conform with state regulations. Excepting in very unusual conditions, prescriptions are restricted to medicines and mixtures listed in the latest editions of the United States Pharmacopeia and the National Formulary. A small list of additional remedies which have been accepted as approved in New and Nonofficial Remedies by the Council on Pharmacy and Chemistry of the American Medical Association may be authorized with a view to reimbursement.

Requests for medicines and medical supplies come to the Medical Service Division from two sources, the outpatient departments of the hospitals and city and private physicians. Such requests originating in the outpatient departments are routed on a medical supply form, first through the social service worker of the particular clinic unit for notation of pertinent facts and secondly through the Assistant General Case Supervisor with reference to social and financial factors and then to the Medical Service Division for final action. In evaluating these requisitions the age, the apparent degree of necessity, the relationship of need to continuing at or securing work and other significant factors are taken into consideration. Although the article requested is indicated to correct an abnormality, nevertheless the request is not always granted. The deviation from the normal may be quite minor. The age and general condition of the patient may be such that the requested article would have no bearing on the individual's activity. In general, then, the principle is observed not to authorize such needs which the average taxpayer would not purchase for himself out of his own private funds.

The problem of hospitalization is a large financial problem. In Rochester we have three distinct means of meeting this need for the dependents. There is a Municipal Hospital operated by contract by the University of Rochester in conjunction with the Strong Memorial Hospital, both units in turn being affiliated with the medical school of the university; five private hospitals, and a county hospital under the supervision of the county commissioner of public welfare. The operation of the Municipal Hospital costs the city about $400,000, care authorized in the private hospitals about $175,000, and care authorized in the County Hospital about $200,000. The private hospitals are paid a per diem rate of $4 with no extras. The County Hospital rate is about $15 a week. The per diem cost at the Municipal Hospital of course varies with its occupancy, less when the occupancy is high and more when the occupancy is low.

From the foregoing it can readily be seen that there are three important factors involved in the problem of hospitalization:

1. The problem of keeping the Municipal Hospital reasonably full. This involves a question of economy.

2. The problem of minimum interference with the intake of city cases by the private hospitals. These hospitals are an asset to the community. They fulfil a need in the community.

3. The problem of the care of the chronic cases, both by direct admission to the County Hospital and by transfer there from the private hospitals.

The attempt is being made to solve this rather complicated and conflicting problem under the following regulations. These regulations were approved by the hospital directors before they were put into effect:

1. Urgent cases are accepted at any hospital on arrival. If authorization is requested, authorization is given if warranted.

2. Cases that are not urgent, but which have been worked up in the clinics, are referred to the Medical Service Division before admission to the hospital. Authorization, if warranted, is made to the hospital or clinic where the case was worked up.

3. Cases that are not urgent and new to the clinic for the condition requiring hospitalization are referred in person to the Medical Service Division for investigation and disposition. The disposition usually is reference to the Municipal Hospital.

A distinction is made in cases referred for hospitalization between those active on relief and those inactive. In the active case the request is referred to the welfare visitor of the patient or family for guidance, but in the inactive case the investigation is made by a staff of investigators attached to the Medical Service Division. In the inactive group, however, no investigation is initiated until application has been made by the patient or a responsible member of the family for payment of the hospital bill by the Department of Public Welfare.

In certain cases, application for hospitalization is not accepted.

1. The Veteran group—these are referred to the respective organization.

2. The tuberculosis group—because of other existing facilities.

3. The tonsil and adenoid group of children under 16 years of age—because of other existing facilities, and

4. The maternity group—also because of other existing facilities.

The hospital referral form is carefully considered in the disposition of the request for authorization of hospitalization. If the patient is already admitted to the hospital and the referral indicates no apparent emergency, the hospital is requested to explain what emergency indicated admission prior to authorization. No further action is taken on the referral until after the requested information is given. If the family does not make application for hospitalization within thirty days after admission, the hospital is so notified. Applications are not accepted sixty days after hospitalization. If the family can make partial and deferred payment of the hospital bill, the case is not accepted and the hospital is so notified. Compensation, liability and legal residence factors are also given careful consideration.

When authorization is requested for an acute exacerbation of a chronic condition, the authorized stay is usually limited

to the period of the exacerbation and arrangements are made for the transfer of such cases to the County Hospital if further hospitalization is indicated.

COMMENT

The foregoing, in a rather sketchy form, outlines the facilities and procedures followed in Rochester in the effort to provide for medical and hospital care for dependent individuals. Of course, the need is not met 100 per cent. The burden of the average small taxpayer cannot be overlooked any more than he can overlook the inability of our voluntary health agencies to raise sufficient funds to meet the calls on them for adequate service. There is, however, a growing sense of public responsibility for meeting the health needs of our dependents. These health needs are beginning to be recognized as a public health problem. An individual case of illness, an illness which involves only personal health and which is not a menace to public health usually is not considered a public health problem. However, an accumulation of such conditions does become a matter of public health. It then does become a matter of public responsibility. Our aim has been to coordinate our medical resources and to utilize these resources most efficiently and economically, having in mind the needs of the dependent and the ability of the community to meet these needs.

Our program in Rochester does attempt to meet in a reasonable measure the medical needs of the dependent. Quite naturally, it does not meet all the demands that are made for service. A number of requests are refused either because the condition is deemed relatively trivial or because means of satisfying the demands exist in responsible members of the family. The problem of relief is so great that relief funds, either state or local, should not be expended on those individuals able to finance their own needs. This restriction should apply to medical and hospital care at public or private expense just as it does to other basic needs. Neither clinics nor hospitals should be expected to supply medical service to those who are able to pay reasonable professional fees for such service. Such a policy is essential in order to conserve the facilities and funds, both public and private, so as to make it possible to give more adequate service to those who are dependent.

This entire question of meeting the medical needs of the dependent through public and private funds is in a state of transition. How great will this problem continue to be? What effect will the recent social legislation have? I refer to legislation respecting old age security, retirement pension provisions, and unemployment insurance. At the same time there has developed in various parts of the country for the medium income group a variety of voluntary plans for the payment for medical service, such as group prepayment or insurance, deferred and partial payment, and group insurance to provide for hospitalization. It is yet too early to evaluate these new schemes. Without question some of these plans have value and will become recognized and approved facilities for securing medical and hospital care. Also, the entire scheme of state aid under the Temporary Emergency Relief Administration in our state in a short time will be transferred to a reorganized State Department of Public Welfare. All these and many other factors have a bearing on this question. Consequently, the problem is quite complicated. However, the realization in advance of these many complicating factors should help in the proper solution of the problem.

Of one thing I am certain: local facilities, both public and private, are unable to give adequate medical care to their dependents. Local funds are inadequate to meet the need. The state through one agency or another will continue to share the responsibility of meeting this problem, if the problem is to be met adequately.

277 Alexander Street.

Association News

ANNUAL CONFERENCE OF STATE SECRETARIES

The Annual Conference of Secretaries of Constituent State Medical Associations will be held in the American Medical Association Building, 535 North Dearborn Street, Chicago, November 16 and 17.

The program will be as follows:

MONDAY, NOVEMBER 16, 10 A. M.

Call to Order. Rock Sleyster, Chairman of the Board of Trustees of the American Medical Association.

Address. Charles Gordon Heyd, President of the American Medical Association.

Basic Science Laws. Mr. J. W. Holloway, Bureau of Legal Medicine and Legislation, American Medical Association.

The Michigan Filter System. L. Fernald Foster, Secretary of the Michigan State Medical Society.

The Public Health League of California. Glenn Myers, Los Angeles.

12:30 p. m. Luncheon.

MONDAY, NOVEMBER 16, 2 P. M.

Address. J. H. J. Upham, President-Elect, American Medical Association.

The United States Public Health Service and the Social Security Act. Thomas Parran, Surgeon General, United States Public Health Service.

The Children's Bureau and the Social Security Act. Miss Katharine F. Lenroot, Chief, Children's Bureau, United States Department of Labor.

Practical Hints on the Preparation of Manuscripts and Illustrations. Richard M. Hewitt, Rochester, Minn.

MONDAY, NOVEMBER 16, 6:30 P. M.

Dinner Conference of Editors of State Medical Journals. Holman Taylor, Secretary-Editor, State Medical Association of Texas, presiding.

TUESDAY, NOVEMBER 17, 9:30 A. M.

Insurance Against Alleged Malpractice. Mr. Thomas V. McDavitt, Bureau of Legal Medicine and Legislation, American Medical Association.

The Scientific Exhibit at Annual Meetings of State Medical Associations. Thomas G. Hull, Director, Bureau of Exhibits, American Medical Association.

REFERRED FOR DISCUSSION BY HOUSE OF DELEGATES

Consultation and Correspondence with Bureau of Legal Medicine and Legislation.

Violation of Laws Pertaining to Narcotics.

RADIO BROADCASTS

The American Medical Association and the National Broadcasting Company are presenting the second series of dramatized health broadcasts under the title Your Health. The first broadcast in the new series, the thirty-second dramatized cooperative broadcast under the title Your Health, was given October 13. The theme for 1936-1937 differs slightly from the topic in the first series, which was "medical emergencies and how they are met." The new series is built around the central idea that "100,000 American physicians in great cities and tiny villages, who are members of the American Medical Association and of county and state medical societies, stand ready, day and night, to serve American people in sickness and in health."

The program will go out on the Blue network instead of the Red, as originally announced. The announcement cards that were sent out when the program was planned for the Red network can be changed simply by substituting the word "Blue" for "Red" where it occurs.

The topics are announced monthly in advance in *Hygeia*, the Health Magazine, and three weeks in advance in each issue of THE JOURNAL. The topics and speakers for the next three programs are:

November 10. Noise. Paul A. Teschner, M.D.
November 17. Football Injuries. Morris Fishbein, M.D.
November 24. Be Thankful. W. W. Bauer, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

State Association News.—The council of the California Medical Association is holding a special meeting November 7 to consider the inauguration of a voluntary hospital insurance plan, which would be statewide in scope and under medical control.——The annual conference of county society secretaries will be held in San Francisco February 6.

The Lane Lectures.—Dr. Eugene F. Du Bois, professor of medicine, Cornell University Medical College, and medical director of the Russell Sage Institute, New York, will deliver the Lane Lectures at Stanford University School of Medicine, San Francisco, April 5-9, 1937. The subject of the lectures will be "Mechanism of Heat Loss and Temperature Regulation."

State Board Reelects Officers.—At the annual meeting of the California State Board of Medical Examiners in Sacramento, October 19, the following officers of the board were reelected: Dr. William R. Molony, Los Angeles, president; Dr. Clark L. Abbott, Richmond, and Dr. Charles B. Pinkham, San Francisco, secretary. Dr. Pinkham has held his position for twenty-four years.

Society News.—At a meeting of the Alameda County Medical Association, October 19, the speakers were Drs. Theodore C. Lawson on "Tumors of the Colon"; William Whitfield Crane, "Surgical Aspects of Jaundice"; Don D. Weaver, "Acute Intestinal Obstructions," and Dexter N. Richards, "Problems in Gastric Surgery." All are from Oakland.——Dr. Roger Anderson, Seattle, addressed the Hollywood Academy of Medicine, October 29, on "An Ambulatory Method of Treating Fractures of the Lower Extremity."——At a meeting of the Los Angeles County Heart Association, October 21, Dr. Morris H. Nathanson, Los Angeles, discussed "The Pathology and Pharmacology of Cardiac Syncope and Sudden Death."

CONNECTICUT

Personal.—Dr. Carlton K. Heady has been appointed town health officer of Milford, and Dr. Robert M. Taylor health officer of East Haven, succeeding Dr. Paul H. Brown.——Dr. Wilmar Mason Allen has been appointed director of Hartford Hospital, it is reported. He has been a member of the staff for several years.

University News.—At a meeting of the Yale Medical Society in the Sterling Hall of Medicine, Yale University, October 14, Dr. John P. Peters, Anna J. Eisenman, Ph.D., and Pauline N. Hald, B.A., discussed "Osmotic Exchanges in the Blood"; Abraham White, Ph.D., and Kurt G. Stern, Ph.D., "Studies on the Physiologically Active Group of Insulin"; William W. Greulich, Ph.D., "A New Syndrome Associated with Testicular Tumors in Cryptorchid Dogs," and Alfred Z. Gilman, Ph.D., and Dr. Louis S. Goodman, "Secretion of an Antidiuretic Hypophyseal Hormone in Response to the Need for Renal Water Conservation."

DELAWARE

State Medical Election.—Dr. Charles P. White, Wilmington, was chosen president of the Delaware State Medical Society at its recent annual meeting in Rehoboth. Vice presidents are Drs. Charles G. Harmonson, Smyrna, and John Roscoe Elliott, Laurel. Dr. William H. Speer, Wilmington, was reelected secretary.

FLORIDA

New Tuberculosis Bureau.—The state department of health has established a tuberculosis bureau with Dr. Arthur J. Logie, Chattahoochee, as director. One of the first activities of the bureau will be a survey to determine the need for clinics throughout the counties. A mobile laboratory will be operated in sections not cared for by county health units.

Personal.—Dr. Harold D. Van Schaick, Jacksonville, has been named a member of the state board of medical examiners, succeeding Dr. Simon E. Driskell, Jacksonville.——Dr. Arnold S. Anderson, St. Petersburg, has been appointed a member of the state tuberculosis board.——Dr. Joseph S. Spoto, Tampa, has been appointed director of the Hillsborough County health unit.

GEORGIA

Appointments to State Board.—Drs. Horace G. Huey, Homerville, has been appointed a member of the state board of medical examiners for a term of six years. Dr. Harold F. McDuffie, Atlanta, has been named to fill an unexpired term on the board.

Dr. Boyd Addresses Pathologists.—Dr. William Boyd, professor of pathology, University of Manitoba Faculty of Medicine, Winnipeg, delivered the annual lecture of the Georgia Association of Pathologists, October 19, in Atlanta. His subject was "Bronchogenic Carcinoma."

Crawford W. Long Prize.—The *Journal of the Medical Association of Georgia* for October announces that five copies of all papers read before the 1936 annual meeting of the association, which contain original work by their authors, should be submitted to the chairman of the Crawford W. Long Memorial Prize committee, Dr. William R. Dancy, 102 West Jones Street, Savannah. The features of each article which the writer claims to be original should be stated in a letter addressed to the committee and submitted with copies of the paper.

ILLINOIS

Society News.—Dr. Leroy H. Sloan, Chicago, discussed "Differential Diagnosis of Common Causes of Coma" before the Bureau County Medical Society, October 13.——The Carroll County Medical Society was addressed in Savannah, October 13, by Drs. John W. Powers, Milwaukee, and Harry M. Hedge, Chicago, on diseases of the skin and compound fractures respectively.

Chicago

The Plan for Hospital Care.—A new low cost hospitalization program, known as the "plan for hospital care," has been adopted by the Chicago Hospital Council. Contracts have been sent to Chicago's hospitals. Individuals may become subscribers to the plan, but all subscribers must make application in groups of ten. Each contract is executed individually and not by group, but subscribers may make payments through their companies by payroll deductions or having a company remitting agent. In small firms, where such procedure is not practical, payments will be made either in full at the beginning of the contract or in quarterly remittances. The annual fee is $9.60. In addition, each subscriber may designate a dependent for whom he may purchase half coverage. After designating the first dependent for an annual fee of $4.20, the subscriber may for another $2.20 cover in a group all the other members of his family who qualify as dependents. All contracts become effective ten days after the date of the certificate, except that in case of accident or emergency illness hospital care will be provided immediately. The contract does not cover pulmonary tuberculosis after diagnosis, or any care provided under the workmen's compensation laws of any state or the United States. If a subscriber requires emergency or accident treatment outside Chicago, his bill is paid to the extent of $6 a day so long as he selects a hospital which maintains a standard of care and scale of rates satisfactory to the corporation and the Illinois State Department of Public Welfare. Major benefits under this plan include twenty-one days of hospital care covering board and room in semiprivate accommodations; general nursing service; operating room and auxiliary services; delivery room and obstetric service for a subscriber in good standing more than twelve months; anesthesia when the services are rendered by salaried employees of the hospital; ordinary drugs, medications and dressings; pathologic and laboratory services, and x-ray examinations when considered necessary by the attending physician. Incorporators of the Hospital Service Corporation, which will carry out the project, include Mr. Charles H. Schweppe, president, St. Luke's Hospital; Dr. Arthur C. Bachmeyer, director of the University of Chicago Clinics; Rev. John W. Barrett, director of Catholic hospitals in Chicago; Dr. Irving S. Cutter, dean, Northwestern University School of Medicine; J. Dewey Lutes, superintendent, Ravenswood Hospital, and Taylor Strawn, president of Grant Hospital.

INDIANA

State Medical Election.—Dr. Herman M. Baker, Evansville, was chosen president-elect of the Indiana State Medical Association at the recent annual meeting in South Bend, and Dr. Edmund D. Clark, Indianapolis, will take over the duties of president January 1. The next annual session will be held in French Lick.

District Meetings.—At the meeting of the Union District Medical Association in Rushville, October 22, the speakers included Drs. Walter U. Kennedy, Newcastle, on state

medicine; Ezra V. Hahn, Indianapolis, results of collapse therapy in tuberculosis, and Mason B. Light, Indianapolis, bronchoscopy as a diagnostic aid.——The Eleventh District Medical Association held its fall meeting in Huntington, October 28; speakers included Drs. Jesse O. Arnold, Philadelphia; George J. Garceau, Indianapolis; Paul W. Ferry, Kokomo, and Charles P. Emerson, Indianapolis.

IOWA

Dr. Peterson Named Professor of Surgery.—Dr. Frank R. Peterson, associate professor of surgery, State University of Iowa College of Medicine, Iowa City, has been appointed professor and head of the department of surgery, succeeding the late Dr. Howard L. Beye. Dr. Peterson is 42 years of age. He graduated from the State University of Iowa in 1918 and from the school of medicine in 1920. He has been affiliated with the faculty of the university since 1921.

Society News.—Dr. Milo G. Meyer, Marshalltown, addressed the Jasper County Medical Society in Newton, September 1, on "The Irritable Colon."——At a meeting of the Johnson County Medical Society, October 7, Dr. Ruben Nomland, Iowa City, discussed "Classification and Treatment of Eczema and Dermatitis."——Wilber J. Teeters, Ph.C., Iowa City, addressed the Washington County Medical Society in Kalona, September 29, on "Chemistry in the Detection of Poisons."——The Southeastern Iowa Medical Society was addressed in Mount Pleasant, October 15, among others, by Drs. Mazyck P. Ravenel on immunization against infectious diseases, and Marcus Pinson Neal, cancer viewed as a preventable disease. Both are of Columbia, Mo.

KENTUCKY

District Meetings.—At a meeting of the tenth councilor district of the Kentucky State Medical Association in Lexington, September 18, the speakers included Drs. Thomas M. Marks, Lexington, on "Early Diagnosis of Brain Diseases in Children"; David M. Cox, Louisville, "Endocrine Function and Dysfunction in Gynecology," and Ernest B. Bradley, Lexington, "Insulin Protaminate."——The Seventh District Medical Society met in Lancaster in September with the following speakers: Drs. John W. Scott, Lexington, pneumonia; Ellis S. Allen, Louisville, fractures of the long bones; Robert F. Monroe, treatment of occipital posterior positions, and Harry S. Andrews, Louisville, birth injuries.——Among the speakers at a meeting of the Third District Medical Society in Hopkinsville, September 16, were Drs. Guthrie Y. Graves, Bowling Green, on "Gas Gangrene Following Sacral Anesthesia," and Beverly Douglas, Nashville, "Plastic Procedures of Interest to the Practitioner."

LOUISIANA

Charity Hospital to Be Rebuilt.—Eight million dollars will be expended in a building program at Charity Hospital, New Orleans. The main building of this unit, which was erected in 1832, has been condemned and will be replaced with a twenty story modern hospital, newspapers report. Part of a PWA grant of $3,600,000 recently given to the state will be used to finance a part of the construction. The group will ultimately provide facilities for 2,470 patients, it was stated.

Society News.—The Orleans Parish Medical Society was addressed, October 12, by Drs. Daniel N. Silverman, New Orleans, on "Continuous Drip Blood Transfusion"; Theodore J. Dimitry, "The Introduction of Leprosy into Louisiana"; Dr. Eleazar R. Bowie gave a demonstration of simplified projection of x-ray films. Mr. Archibald H. McIndoe, London, England, addressed a special meeting of the society, October 5, on plastic surgery.——At a meeting of the Bi-Parish Medical Society in Jackson, recently, speakers were Drs. Hiram W. Kostmayer, New Orleans, and Lionel F. Lorio, Baton Rouge, on endocrinology and diseases of the mastoid.

MARYLAND

Marihuana Farm Found Near Baltimore.—A marihuana farm described as one of the largest ever found in this country was discovered on the eastern edge of Baltimore, October 3, newspapers reported. The leaves of the 3,000 drug plants were estimated to be worth $1,000,000 on the retail market. Most of the leaves of the marihuana plants, which were in the center of the field and concealed by tomato plants, pumpkins and cornstalks, were still green and unfit for immediate use. A police guard was posted at the farm until the plants could be dug up and burned.

MASSACHUSETTS

Personal.—Dr. Walter B. Cannon, George Higginson professor of physiology, Harvard University Medical School, Boston, has been elected a corresponding member of the National Academy of Medicine of Buenos Aires, Argentina.

Harvey Society Lectures.—The William Harvey Society of Tufts College Medical School, Boston, announces the following lectures at the Beth Israel Hospital:

Dr. Henry E. Sigerist, Welch professor of the history of medicine, Johns Hopkins University School of Medicine, December 11, The Social Problems Confronting Medicine Today.
Dr. Siegfried J. Thannhauser, associate professor of medicine at Tufts, January 15, The Development of Our Knowledge of Metabolism.
Dr. Richard C. Cabot, Cambridge, professor of clinical medicine, emeritus, Harvard University Medical School, February 12, The Wisdom of the Body.
Dr. John M. Wheeler, professor of ophthalmology, Columbia University College of Physicians and Surgeons, New York, March 5, Various Types of Grafts Used in Plastic Surgery About the Eyes.
Dr. James B. Collip, professor of biochemistry, McGill University Faculty of Medicine, Montreal, Que., April 16, Significance of Recent Studies on the Anterior Pituitary and Related Glands.

MICHIGAN

The Wayne County Programs.—The Wayne County Medical Society held a public meeting, October 26, with Dr. Victor G. Heiser, New York, as the speaker on "Medical Adventures During Sixteen Trips Around the World." Dr. Thomas Archibald Malloch, librarian, New York Academy of Medicine, New York, spoke, November 2. A joint meeting of the medical section with the Detroit chapter of the American Association of Social Workers, November 9, will be addressed by Dr. John H. J. Upham, Columbus, Ohio, President-Elect, American Medical Association, on "The Relation of the Social Worker to Medical Practice." Dr. James Burns Amberson Jr., New York, will speak at a general meeting, November 16, and on November 30 the surgical section will be addressed by Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, on "New Forms of Medical Practice."

Features of Medical School Opening Exercises.—Honorary degrees of master of science and doctor of science, respectively, were conferred on Drs. Russell S. Rowland, Detroit, and Reuben Peterson, Ann Arbor, September 26, by the University of Michigan at the eighty-seventh annual opening exercises of the medical school. Dr. Peterson retired from the faculty of the medical school in 1931 as emeritus professor of obstetrics and gynecology. A portrait of the late Dr. Albert Moore Barrett was presented to the university by Dr. Robert H. Haskell, medical superintendent of the Wayne County Training School, Northville. It was executed by John Koch, Ann Arbor. Dr. Barrett at the time of his death in April was professor of psychiatry at the university and director of the state psychopathic hospital. The Sternberg Medal for outstanding work in preventive medicine was presented to Dr. Homer Allen Howes, Coldwater, now an intern at the University Hospital.

MINNESOTA

Special Meeting of House of Delegates.—The House of Delegates of the Minnesota State Medical Association held a special session at the Hotel Lowry, St. Paul, November 1. The meeting was called to formulate and define principles and policies of organized medicine for submission to the interim committee of the state legislature, which is now engaged in shaping legislation to be introduced at the next session for the uniform and coordinated handling of social security, relief and welfare activities in the state. The committee was created by a resolution adopted at the 1935-1936 special session of the legislature.

NEW HAMPSHIRE

Medical School News.—Dr. Hermann Burian, formerly assistant to the director of the eye clinic of the University of Bern, has been appointed visiting research fellow in the department of physiologic optics at Dartmouth Medical School, Hanover. Dr. Nathan T. Milliken, Canandaigua, N. Y., superintendent of Oak Mount Sanitarium, Holcomb, N. Y., has been appointed instructor in physical diagnosis.

NEW JERSEY

Society News.—Dr. William P. Murphy, Boston, will address the Academy of Medicine of Northern New Jersey, November 19, on "Clinical Findings and Treatment of Pernicious Anemia." Dr. Paul Klemperer, New York, addressed the academy, October 15, on "Newer Aspects of Liver Pathology." Dr. Foster Kennedy, New York, gave a public lecture

at the academy, October 29, on "The Organic Background of Mind."——Thomas Cook, D.D.S., Philadelphia, addressed the Burlington County Medical Society, Burlington, September 9, on "Diseases of the Mouth and Their Importance to the Physician."——The Passaic County Medical Society held an "Interns' Night" at its meeting in Paterson, September 10; the speakers were Drs. David Doktor, Barnert Memorial Hospital, Paterson, on "Anemia in Association with Achlorhydria"; Seymour Schotz, St. Joseph's, "Hodgkin's Disease"; Irving M. Ariel, Paterson General, "Lymphogranuloma Inguinale"; Rochelle Burstein, Passaic General, "Childhood Eczema," and Oscar H. Cohen, St. Mary's, "A Case of Liver Abscess."

NEW YORK

Society News.—Dr. Russell M. Wilder, Rochester, Minn., addressed the Rochester Academy of Medicine, October 1, on "The New Insulin."——Dr. Howard T. Langworthy, Brooklyn, addressed the Medical Society of the County of Nassau, Mineola, October 27, on "Carbuncle of the Kidney."——Dr. Wilbur Ward, New York, addressed the Medical Society of Westchester County, Grasslands, on obstetric technic and Dr. Arthur W. Bingham, East Orange, N. J., on a maternal welfare program in progress in New Jersey.——Dr. Charles A. Perry addressed the Medical Society of the County of Albany, October 28, on "Coronary Heart Disease."——Dr. Anton W. Sohrweide Jr., Syracuse, addressed the Seneca County Medical Society, Willard, October 8, on treatment of diseases of the skin.

District Meetings.—At a meeting of the Third District Branch of the Medical Society of the State of New York in Albany, September 22, the scientific program was presented by Drs. Daniel M. Brumfiel, Saranac Lake, speaking on "Diagnosis and Significance of Silicosis"; Herbert M. Bergamini, New York, "Fundamentals in the Treatment of Fractures"; John J. Rainey, Troy, "A Review of Nasal Accessory Sinuses." Dr. Edward S. Godfrey Jr., state commissioner of health, discussed plans for using federal appropriations to the department of health. Drs. Floyd S. Winslow, Rochester, president of the state society, Peter Irving, New York, secretary, and David J. Kaliski, New York, chairman of the committee on workmen's compensation, spoke on state society activities.——Among speakers before the Fourth District Branch of the Medical Society of the State of New York at Plattsburg, October 2-3, were Drs. James B. Collip, Montreal, on hormones and Lewis M. Hurxthal, Boston, congestive heart failure. Drs. Floyd S. Winslow, Rochester, and John B. Wheeler, Burlington, Vt., were speakers at a dinner at the Hotel Cumberland.——The Fifth District Branch of the Medical Society of the State of New York met at the Rome State School, Rome, October 1. Guest speakers included Drs. Donald Guthrie, Sayre, Pa., on "Surgical Aspects of Peptic Ulcer" and Edwin P. Maynard Jr., Brooklyn, "Cardiovascular Syphilis."

New York City

Friday Afternoon Lectures.—Dr. Russell S. Fowler delivered the Friday afternoon lecture of the Medical Society of the County of Kings, October 16, on "Diagnosis of Abdominal Tumors." Dr. Charles A. Gordon spoke October 23 on "Everyday Obstetrics" and Dr. Herman O. Mosenthal, October 30, on "Surgical Emergencies in Diabetes and Their Treatment." Dr. Sam Z. Levine spoke November 6 on "Water Metabolism in Normal Infants."

Personal.—Dr. George Henry Fox, for many years a member of the faculty of the College of Physicians and Surgeons, Columbia University, celebrated his ninetieth birthday October 8. Dr. Fox was clinical professor of diseases of the skin from 1881 to 1904 and professor of dermatology from 1904 to 1907. He also taught at various times at the Woman's Medical College of New York Infirmary, the old Starling Medical College, Columbus, Ohio, and the New York Post-Graduate Medical School. He was president of the Medical Society of the State of New York in 1895. He is the author of numerous publications on diseases of the skin.

Staff Appointments Available.—Three appointments in the general service of the Hospital for Joint Diseases to begin July 1, 1937, and three to begin Jan. 1, 1938, will be made by an examination to be held December 29 at the hospital. Registrations for the examination must be received by December 15. The appointments are for two years' rotating service. Graduating students and graduates (unmarried men) of class A medical schools are eligible. The hospital provides maintenance and uniforms. Applications should be addressed to the director of the hospital, Madison Avenue and One Hundred and Twenty-Third to One Hundred and Twenty-Fourth streets.

NORTH CAROLINA

Specialty Society Meeting.—The North Carolina Eye, Ear, Nose and Throat Society held its second annual meeting in Durham, October 8. Among the speakers was Dr. Angus L. MacLean, Baltimore, on "Etiology of Iritis from an Experimental Standpoint." Dr. James M. Lilly, Fayetteville, was elected president and Dr. Franklin C. Smith, Charlotte, secretary.

Symposium at Duke University.—The third annual symposium at Duke University School of Medicine, Durham, was presented October 15-17 on diseases of the heart, circulation and kidneys. The speakers were Drs. Stewart R. Roberts, Atlanta; Soma Weiss, Boston; William B. Porter, Richmond, and James Edwin Wood Jr., Charlottesville, Va.; William de B. MacNider, Chapel Hill; Frank N. Wilson, Ann Arbor, Mich.; Herrman L. Blumgart, Boston; Charles C. Wolferth, Philadelphia; Claude S. Beck and Carl J. Wiggers, Cleveland; James C. White, Boston; Mont R. Reid, Cincinnati; William F. Braasch, Rochester, Minn.; Warfield T. Longcope, Louis Hamman and Hugh H. Young, Baltimore.

OHIO

Personal.—Dr. Gertrude Felker, Dayton, recently received the honorary degree of master of arts at Rockford College, Rockford, Ill.——Dr. Albert F. Green, Cleveland, recently celebrated his fiftieth anniversary in the practice of medicine.

State Medical Election.—Dr. John B. Alcorn, Columbus, was named president-elect of the Ohio State Medical Association at the annual meeting in Cleveland, October 8, and Dr. Edwin M. Huston, Dayton, was installed as president. The next annual meeting will be in Dayton.

Postgraduate Day in Akron.—The Summit County Medical Society will present its fifth Postgraduate Day at the Mayflower Hotel November 11. The guest speakers will be Drs. Fred H. Albee, New York, who will discuss surgery of the knee and fractures of the neck of the femur; Arlie R. Barnes, Rochester, Minn., diagnosis of gastro-intestinal disease and fitting the diet to the patient, and Martin H. Fischer, Cincinnati, diabetes and coma.

OREGON

State Medical Election.—Dr. Charles T. Sweeney, Medford, was chosen president-elect of the Oregon State Medical Society at the annual meeting at The Dalles, October 10, and Dr. Thomas W. Watts, Portland, was installed as president. The following were elected vice presidents: Drs. Charles E. Sears, Portland; John C. Vandevert, Bend, and William W. Baum, Salem. Dr. Morris L. Bridgeman, Portland, was reelected secretary.

PENNSYLVANIA

Society News.—Dr. Walter J. Larkin, Scranton, was elected president of the Pennsylvania Association of School Physicians at the annual meeting in Pittsburgh in October; Dr. Henry R. Steadman, Erie, vice president, and Dr. Mary J. Baker, New Castle, secretary.

State Medical Election.—Dr. Frederick J. Bishop, Scranton, was chosen president-elect of the Medical Society of the State of Pennsylvania at the annual meeting in Pittsburgh, October 7. Dr. Maxwell J. Lick, Erie, became president and Dr. Walter F. Donaldson, Pittsburgh, was reelected secretary. The 1937 meeting will be held in Philadelphia, October 4-7.

Philadelphia

Medical College News.—Dr. Thomas A. Shallow, professor of surgery, Jefferson Medical College, delivered the address at the opening exercises of the school September 21 on "Medical Progress."——Temple University School of Medicine opened its thirty-fifth session September 23 with an enrolment of 447. The freshman class of 100 was selected from 1,093 applicants.

Fund for Study of Digestive Disorders.—The bulk of an estate estimated at more than $200,000 was bequeathed to the University of Pennsylvania by the late Frances T. Kinsey to support and develop the Gastro-Intestinal Clinic at the University Hospital under the direction of Dr. Thomas Grier Miller, or for such other activities in this field as he may desire. After Dr. Miller severs his connection with the university hospital the income is to be used for such similar activities as the professor of medicine may desire. The fund will be known as "The Kinsey-Thomas Foundation for the Study and Treatment of Diseases of the Digestive System." It is to be a memorial to two sisters and a brother-in-law of Miss Kinsey.

Pittsburgh

Hospital News.—Dr. Henry A. Christian, Hersey professor of the theory and practice of physic at Harvard University Medical School, Boston, spoke on "Diuretics" at the annual celebration of "West Penn Day" at the Western Pennsylvania Hospital October 20.

Society News.—At a meeting of the Allegheny County Medical Society, October 20, acute appendicitis was the subject of discussion. Dr. William W. Briant Jr., Mount Lebanon, spoke on the disease as seen in children; Dr. Harold G. Kuehner, in adults, and Dr. Harry E. Feather, in the older patient.——The last of three pediatric institutes sponsored by the state department of health and the Medical Society of the State of Pennsylvania in Pittsburgh was held at the Western Pennsylvania Hospital October 28. Dr. Henry C. Flood presided, and the speakers were Drs. Edmund R. McCluskey, on respiratory diseases; Carl L. Ruder, blood dyscrasias, and Minor D. Silberberg, allergy and endocrinology.

SOUTH CAROLINA

Society News.—Dr. Robert W. Ball, Columbia, addressed the York County Medical Society, September 24, on "Maternal Preventive Medicine."——At a meeting of the Seventh District Medical Association in Kingstree, September 17, the speakers included Drs. Hal McCluney Davison, Atlanta, on "Nonspecific Treatment of Allergic Diseases"; Hamilton W. McKay, Charlotte, N. C., "Pyelocystitis Complicating Pregnancy"; Frank K. Boland, Atlanta, "Surgical Treatment of Pulmonary Tuberculosis," and Oscar D. Baxter, Sumter, "Exaltation of Symptoms." Dr. Robert C. Bruce, Greenville, president of the South Carolina Medical Association, made an address on medical economics.

TENNESSEE

Fined for Violation of Medical Practice Act.—Filmore Shoun, Greeneville, was recently fined $175 and costs for violation of the medical practice act. The evidence showed that Shoun applied a salve containing zinc chloride to the nose of a man in Chuckey, to remove a mole. The application of the salve resulted in destruction of a portion of the nose, leaving a complete perforation.

Health at Nashville.—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million for the week ended October 24 indicate that the highest mortality rate (23.8) appeared for Nashville and that the rate for the group of cities as a whole was 11.3. The mortality rate for Nashville for the corresponding week of 1935 was 12.2 and the rate for the group of cities was 10.7. The annual rate for the eighty-six cities for the forty-three weeks of 1936 was 12.1, as compared with 11.4 for the corresponding period of the preceding year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that a city is a hospital center for a large area outside the city limits or that it has a large Negro population may tend to increase the death rate.

Society News.—Dr. Tinsley R. Harrison discussed the "Treatment of Congestive Heart Failure" before the Nashville Academy of Medicine, October 13; Dr. Joseph T. Gilbert presented a case report on "Meningitis Complicated with Gas Bacillus Infection."——Drs. John W. Hocker and Samuel H. Long, Chattanooga, addressed the Hamilton County Medical Society, November 5, on "The Status of Immunization in Pediatrics" and "Maxillary Sinusitis" respectively.——At a meeting of the Hardin, Lawrence, Lewis, Perry and Wayne Counties Medical Society, September 29, the speakers were Drs. Dexter L. Woods, Waynesboro, on "Compensation (Industrial) in General Practice"; Jere L. Crook, Jackson, "Radium and Its Uses"; John W. Simpson, Nashville, "A New Conception in the Treatment of Senile Vaginitis," and William E. Boyce, Flat Woods, "Hemophilja."——Dr. Frank H. Krusen, Rochester, Minn., addressed the Memphis and Shelby County Medical Society, Memphis, September 1, on "The Relationship of Physical Therapy to General Practice" and James B. Mitchell Jr., Ph.D., Memphis, spoke on "Pharmacologic Aspects of Dilaudid."

TEXAS

State Public Health Meeting.—Dr. Ernest W. Prothro, Temple, was elected president of the Texas Public Health Association at the annual meeting at Kilgore in October. Dr. Reginald M. Atwater, New York, secretary of the American Public Health Association, was among the speakers, discussing the future of public health work. The next meeting will be in El Paso.

Society News.—Drs. Frank H. Newton and Edwin L. Rippy addressed the Dallas County Medical Society, Dallas, September 24, on "Injuries to the Eyes" and "Physical Constitutional Types and Their Relationship to Disease" respectively.——Drs. Cecil S. E. Touzel and McKinley H. Crabb, Fort Worth, addressed the Tarrant County Medical Society in Fort Worth, September 15, on "Childhood Tuberculosis" and "Typhoid Carriers" respectively.——Drs. Carroll M. Pounders and Charles P. Bondurant, Oklahoma City, addressed the Wichita County Medical Society, Wichita Falls, October 13, on nervous disorders of children and treatment of common skin diseases, respectively.

WISCONSIN

Dinner in Honor of Dr. Sleyster.—The Medical Society of Milwaukee County will give a dinner at the Wisconsin Club, Milwaukee, Saturday evening November 14 in honor of Dr. Rock Sleyster, Wauwatosa, chairman of the Board of Trustees of the American Medical Association. Dr. Arthur J. Patek is chairman of the committee in charge and members are Drs. J. Gurney Taylor, Eben J. Carey, Frederick J. Gaenslen and William L. Herner. Dr. Sleyster is a past president of the State Medical Society of Wisconsin.

ALASKA

Outbreak of Scarlet Fever.—It is reported that the schools at Snag Point and Clark Point were closed indefinitely, October 27, due to an outbreak of scarlet fever.

PUERTO RICO

Medical Association Election.—Dr. Juan H. Font, San Juan, was elected president of the Puerto Rico Medical Association at a meeting August 30. Others elected were Drs. Manuel Pujadas Diaz, San Juan, vice president; Dolores M. Pinero, Rio Piedras, secretary, and David E. Garcia, Rio Piedras, treasurer.

GENERAL

Bequests and Donations.—The following bequests and donations have recently been announced:

Michael Reese Hospital, Chicago, $100,000 to endow not less than six beds for needy children under the will of the late Mrs. G. T. Smith.

Hospital and Home for Crippled Children, Newark, $500,000 by the will of the late Clark P. Williams.

Homeopathic Medical and Surgical Hospital and St. Joseph's Hospital, Reading, Pa., $1,500 and $1,200, respectively, under the will of D. Willington Dietrich.

Ohio State University College of Medicine, Columbus, $200,000 by the will of the late Mariette Comly for medical and surgical research and the residuary estate for aid to needy students; Children's Hospital, Columbus, also received $10,000.

Methodist Episcopal Hospital, Philadelphia, $10,000; Chestnut Hill and Germantown hospitals, $5,000 each by the will of the late John Ervin Walt.

Presbyterian Hospital, New York, $20,000 by the will of the late Mrs. S. Augusta Mora.

Yale University, New Haven, $15,384 for fellowships and research in the medical school.

Changes in Status of Licensure.—The Virginia State Board of Medical Examiners recently reported the following action:

Dr. Walter F. Hartman, Swoope, license restored at the June meeting; it had been revoked at the meeting of December 1935 because of narcotic violation.

Dr. Mars L. Madsen, formerly of Paia, Hawaii, license reinstated July 22. License revoked Dec. 28, 1935, because of violation of statutes.

The Massachusetts Board of Registration in Medicine announces the following:

Dr. Julius Saipe, Somerville, license suspended for three months, October 8, for deceit in connection with an accident insurance case.

The Illinois State Department of Registration reports the following action:

Dr. Joseph M. Blakemore, Chicago, license restored.

Dr. Milton M. Glascoe, Jacksonville, license revoked for violation of the Harrison Narcotic Act.

Dr. Russell R. Craft, Chicago, license revoked for his conviction of a felony.

Dr. Edward E. Rohrabaugh, Peoria, license revoked for his conviction of violation of the Harrison Narcotic Act.

The Connecticut State Department of Health reports the following:

Dr. Gaetano G. Petrocelli, Waterbury, license revoked, August 13, having been found guilty of manslaughter.

Society News.—Dr. Cassius H. Watson, medical director of the American Telephone and Telegraph Company, New York, was reelected president of the National Safety Council at its annual congress in Atlantic City, October 5-9.——The Pacific Coast Surgical Association will meet in Seattle, Wash., and Victoria, B. C., Feb. 24-27, 1937.——Dr. Robert D. Mussey, Rochester, Minn., was chosen president-elect of the Central Association of Obstetricians and Gynecologists at the eighth annual meeting in Detroit, October 15-17, and Dr. Jean Paul Pratt, Detroit, was inducted into the presidency. Dr. Calvin R. Hannah, Dallas, Texas, was named vice president, and

Dr. Ralph A. Reis, Chicago, reelected secretary. The next annual meeting will be held in Dallas in November.——Dr. Chester T. Brown, Newark, N. J., was elected president of the Association of Life Insurance Medical Directors of America at the forty-seventh annual meeting in New York, October 22-23. Drs. Samuel B. Scholz Jr., Philadelphia, and Henry W. Cook, Minneapolis, were elected vice presidents and Dr. Edwin G. Dewis, Newark, secretary.——Mr. Robert E. Neff, superintendent, State University Hospitals, Iowa City, was chosen president-elect of the American Hospital Association at its annual meeting in Cleveland recently. Dr. Claude W. Munger, medical director of Grasslands Hospital, Valhalla, N. Y., was installed as president.——Dr. Henry W. F. Woltman, Rochester, Minn., was elected president of the Central Neuropsychiatric Association at its annual meeting, October 10; Dr. George B. Hassin, Chicago, was named vice president, and Dr. Karl A. Menninger, Topeka, Kan., secretary.

Southern Medical Association.—The thirtieth annual meeting of the Southern Medical Association will be held at the Fifth Regiment Armory, Baltimore, November 17-20, with the Baltimore City Medical Society acting as host. Tuesday evening there will be a general public session with the following speakers: Dr. Jonathan C. Meakins, professor of medicine, McGill University Faculty of Medicine, Montreal, on "Heart Disease Versus Longevity"; Dr. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., "Syphilis as a Public Health Problem," and the Rev. Alphonse M. Schwitalla, S.J., dean, St. Louis University School of Medicine, St. Louis, "Medical Education and Medical Practice." Presidents' Night will be observed Wednesday evening. Tuesday will be devoted to general clinical sessions on medicine, surgery and otolaryngology, while Wednesday morning will be given over to general clinical sessions, meeting concurrently, representing all the specialties. The remainder of the program will be devoted to sectional presentations. The annual golf tournament will be played during the meeting and the annual trap and skeet shooting tournament will be held at the Oriole Gun Club, November 18. The woman's auxiliary to the Southern Medical Association will meet, November 18-19, at the Lord Baltimore Hotel. Other organizations meeting at the same time include the southern branch of the American Public Health Association, National Malaria Committee and regions one and two of the American Academy of Pediatrics. An allergy clinic and round table will be held November 19 at the armory, with Dr. Hal M. Davison, Atlanta, as chairman.

Annual Report of the Red Cross.—Preceding its annual roll call, which begins November 11, the American Red Cross issued its report of activities during the fiscal year ended June 30, 1936. In the twelve months covered by the report the Red Cross rendered aid in 105 domestic disasters to 400,000 persons. In addition there were thirty-nine disasters in insular possessions and six in foreign countries. These included the floods in New England, Pennsylvania, southern New York and Ohio, tornadoes in Georgia and Mississippi, hurricanes in Florida, earthquakes in Montana, and epidemics in Kentucky, Missouri, Colorado and Oklahoma. Under a policy adopted the previous year, Red Cross chapters participated in various health projects in cooperation with local health agencies, including typhoid and diphtheria immunization, malaria control, oral hygiene and tuberculin testing of school children. Seventy-seven chapters carried on programs of education on food and nutrition. Public health nurses made 1,070,000 visits during the year. The course in home hygiene and care of the sick was presented to 68,677 students, 25,000 more than in 1932. First aid instruction certificates were issued to 222,693 persons. During the year 867 highway emergency first aid stations were established and 3,617 have been provided for, to be opened as fast as personnel can be trained. The Red Cross expended $7,682,821.20 during the fiscal year. An appeal for funds after the storms and floods of March of this year resulted in gifts amounting to $7,955,963.38. Expenditures for relief in those disasters had amounted to $3,789,408.62 by June 30 and the remainder was being held to cover the balance needed to finish the relief program.

Council of Research in Child Neurology.—Appointment of a council to administer the Friedsam Foundation's program of research in child neurology was announced October 17 by Dr. Bernard Sachs, New York, who is director of the new project. Announcement of a grant from the foundation to finance the new work was made in THE JOURNAL, July 11, page 139. Members of the council are Drs. Louis Hausman, Foster Kennedy, Frederick Tilney, Stanley Brady, Howard Reid Craig and Lewis Clark Wagner; Mr. William E. Grady, associate superintendent of public schools in New York and Mr. Nathan Straus. In addition an advisory committee has been appointed with the following members: Drs. Walter B. Cannon, Boston; Harvey Cushing, New Haven, Conn.; Adolf Meyer, Baltimore; Edward A. Strecker, Philadelphia; Lewis J. Pollock and Harold Douglas Singer, Chicago; Ernest Sachs, St. Louis; Walter F. Schaller, San Francisco; Frederick Peterson, Charles R. Stockard, Herbert B. Wilcox and Alfred Wiener, New York; Georges Guillain, Paris; Samuel Alexander Kinnier Wilson, London, and Otto Marburg, Vienna. The research program will include studies of (1) organic and functional diseases of the nervous system in children, (2) neuroses and psychoses in early life, and (3) social personality and home problems. It will be carried out through grants and scholarships to research workers all over the world. The council will consider only original work that promises to be fruitful of results, and the applicant must state distinctly the problem under investigation and the methods to be pursued, it was said. Results of the work will be recorded in volumes to be issued by the council from year to year. This program is distinct from a similar program begun at the Neurological Institute, New York, two years ago through a grant of $100,000 from the Friedsam Foundation, it was explained.

CANADA

Society News.—Dr. James R. Corston, Halifax, was elected president of the Nova Scotia Medical Society at the annual meeting in Halifax, August 31-September 5. In his official address, Dr. Robert M. Benvie, Stellarton, retiring president, discussed sterilization of the mentally unfit. Drs. Herman M. Robertson, Victoria, B. C., and Thomas C. Routley, Toronto, president and secretary, respectively, of the Canadian Medical Association, discussed unification of the provincial societies as component parts of the dominion organization.——The Canadian Physiological Society, organized in 1935, met at Queen's University, Kingston, October 24.——Drs. Austin B. Schinbein and William Elliott Harrison, Vancouver, B. C., addressed the Vancouver Medical Association, October 6, on "Surgical Treatment of Pulmonary Tuberculosis."——Sir Albert James Walton, London, addressed the Toronto Academy of Medicine at a special meeting October 15 on "Some Aspects of Peptic Ulceration." At a special meeting, October 9, Dr. Charles Hill, deputy medical secretary of the British Medical Association, London, spoke on health insurance.

FOREIGN

Cancer Prize Awarded.—Prof. Ernest L. Kennaway, director of the Research Institute of the Cancer Hospital, London, and J. W. Cook, research chemist at the institute, received a prize of 50,000 Belgian francs and 50 mg. of radium offered by the International Cancer Union for scientific work on cancer, *Science* reports. The award was made at the recent Second International Congress on Cancer in Brussels. The prize was made available by the Union Minière du Haut Katanga, a Belgian company that produces a large proportion of the world's supply of radium.

Large Fund for Research at Oxford.—Lord Nuffield, British motor car manufacturer, has offered to the University of Oxford the sum of £1,250,000 for the promotion of medical research. It is his plan to provide graduate training in modern methods of investigation in a special research center under the direction of full time university professors and cooperating with existing hospitals to obtain the necessary clinical facilities. The organization suggested is the establishment of clinical departments of medicine, surgery, gynecology and anesthetics, to be followed by other departments as they seem desirable, as extensions in scope of the medical school and of the Nuffield Institute for Medical Research, which Lord Nuffield gave to the university in 1935. The present gift is said to be the largest ever given by a single donor to any British university.

Personal.—The Weber-Parkes Medal and Prize of the Royal College of Physicians has been awarded to Sir St. Clair Thomson, emeritus professor of laryngology and consulting surgeon for diseases of the throat and nose in King's College Hospital, London, for his work on cancer of the larynx. The Moxon Medal was awarded to Dr. Edward Mellanby, Sheffield, for his work on the problems of nutrition.——Mrs. Irene Joliot-Curie, Paris, has resigned as undersecretary of state for scientific research in the French cabinet.——Dr. John W. McNee, at one time associate professor of medicine, Johns Hopkins University School of Medicine, has been appointed regius professor of the practice of medicine at the University of Glasgow, succeeding Prof. Thomas K. Monro, resigned.——Sir Grafton Elliot Smith has retired as professor of anatomy at University College, London, and Dr. Herbert H. Woollard, professor of anatomy at St. Bartholomew's Hospital Medical School, has been appointed to succeed him.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 26, 1936.

Research in Radium Therapy

The Report of the Radium Institute for 1935, just published, contains some important advances in technic.

RODENT ULCER

During 1935, 191 cases of rodent ulcer were treated. They are classified into (1) hypertrophic, (2) superficial ulcerating, (3) superficial cicatrizing and (4) deep ulcerative. Many of the cases were postoperative recurrences and a few were recurrent after x-ray and radium treatment elsewhere. The majority of the cases in the first three groups were treated by unscreened radium by means of flat applicators for from one and one-half to two hours. For the most extensive superficial hypertrophic and ulcerated varieties, radon seeds with a filter of 0.3 mm. and containing 1.5 millicuries were used. The usual treatment of the deep ulcerative type was gamma radiation by means of radium tubes mounted on stent and Columbia paste wax molds, but needling was done in a few cases. During the past two years a new method has been used for the treatment of rodent ulcers in certain situations, mainly extensive ulcers over bone, as in the frontal region, over the malar bones and in the mastoid region. The lesion is measured and a rectangular figure is marked on the skin with the lesion in the center and 1 cm. of normal skin between each of its sides and the edge of the lesion. A lead tube with a cross section of 8 mm. and walls of 2.5 mm. containing radon is used for treatment. The active length of the tube is equal to one side of the rectangle and its linear intensity is 10 millicuries. Parallel to the side concerned, lines are drawn 8 mm. apart. The tube is covered with strapping and applied along the side of the rectangle. The next field to be treated is the space between this line and the next, and so on for the others. For most lesions the exposure is two hours for each field, except the two outer ones, for which it is two and one-half hours. After every third exposure the radon tube is made up to its original intensity. The results are good and the technic has the following advantages: 1. The tube, since it contains radon, can be made of any length required. 2. The patient can be treated in two or three days without hospitalization. 3. The reaction is slight and does not keep the patient from work.

THE BLADDER IN CARCINOMA OF THE CERVIX

Valuable information may be gained from inspection of the bladder in carcinoma of the cervix. Since 1933 cystoscopy has been done on the first application of radium. The following appearances in the order of their development as the growth extends to the bladder wall have been observed: (1) bulging and distortion of the base of the bladder, (2) dilatation of vessels, (3) transverse striation, (4) bullous edema and (5) growth in the bladder. Distortion does not necessarily indicate invasion of the bladder wall. It may be due only to pressure, when palpation of the anterior vaginal wall will show that the mucous membrane of the bladder moves freely over it. Cystoscopic abnormalities were found in forty-five of 100 cases. Since distortion is regarded as of no significance as regards spread of the disease to the bladder, thirty-eight cases may be said to have shown significant abnormality. Dilatation of the vessels in the bladder base proved to be a bad prognostic sign.

RADIUM BEAM THERAPY RESEARCH

In January 1934 an organization entitled Radium Beam Therapy Research was established in Great Britain to investigate the treatment of cancer by radiation from large quantities of radium at a distance. The Radium Institute placed at its disposal a treatment room and wards. The organization has its own staff of surgeons, a radium therapist and physicists. In January 1934, after the installation of the first 5 Gm. radium unit and again in January 1936, after the second 5 Gm. unit was installed, an exhaustive series of measurements was made on the intensity of the radiation in the treatment and adjoining rooms. As a result it had been possible to make adequate provision for protecting the staff from radiation. The radiation received by nurses is checked daily by condenser measurements. No ill effects have been observed. Each application of the unit is made by a medical officer. After the unit has been placed in position the patients are under continuous observation by a nursing sister from an observation room at a distance. This is made possible by using a system of mirrors between the observation and treatment rooms. Microphones and loud speakers enable the patients under treatment and the nurse to communicate at will. The apparatus used to contain the first 5 Gm. unit was designed by Sievert of Stockholm. The second was designed at the Radium Beam Therapy Research and has several new features. In the interests of protection the new dense tungsten alloy developed here has been freely used and a rotable eccentric screen has been provided to secure the maximum protection for the patient. An important advance is perfection of pneumatic transference, so that the radium holder is blown by air pressure to and from the storage safe to the unit. The position of the radium is indicated by lamps on a control panel in the observation room. The system reduces exposure of the staff to zero.

Efforts have been made to devise a scientific scheme of estimating dosage. An instrument designed at the research has enabled extensive investigations into tissue dosage to be made. Before constructing this instrument it was not possible to determine tissue doses either in such detail or with such accuracy. These investigations have proved of inestimable value in developing the treatment and, by placing it on a more scientific basis, in advancing teleradium therapy. Many cases that could not have been treated by any other method have been accepted. The results of the treatment have been sufficiently encouraging to justify the continuance and extension of the research.

Industrial Accidents and Diseases

An increase of factory accidents notified in 1935, amounting to an excess of 9 per cent over those for 1934 and 32 per cent over those for 1933, is reported but can be largely accounted for by increased industrial activity. In 1935 there were 149,696 accidents, of which 843 were fatal. Substantial progress in accident prevention has been made in some directions. A comparison of the years 1934 and 1924 shows a reduction of 20 per cent both in the total number of accidents and in the fatalities. The chief inspector of factories is impressed by the active desire of employers' associations to combat the accident menace, especially in the dangerous industries. The principal opportunity for improvement lies in the education of the smaller employers. The returns again show the high rate of accident risks among young workers.

With regard to industrial diseases, the chief inspector finds disconcerting the continued high incidence in certain industries of severe epitheliomatous ulceration. He expects little improvement until periodic examination with a view to early detection becomes prevalent. The rapid displacement of sand and flint grit by steel grit and other innocuous abrasives in the dangerous operation of sand blasting is expected to diminish the incidence of silicosis. Some apprehension is expressed as to the effects of speed, which is the essence of present-day industry. This is exemplified by "the conveyor system," such as exists in the clothing trade, wherein a single operation is performed, minute in and minute out, throughout the working

day. It remains to be seen whether the mental make-up of the present generation is such that work of this nature is detrimental or not.

Catalogue of Type Cultures

The new catalogue of the National Collection of Type Cultures, containing 2,000 entries, has been issued by the Medical Research Council. These cultures are maintained by the council at the Lister Institute of Preventive Medicine in London. Not only has the number of types increased, but through the cooperation of other scientific institutions it has become possible to include important groups of organisms at present conserved by specialists elsewhere. The following examples show the extraordinary variety and sources of the cultures all over the world. Actinomyces dassonvillei: Underground. Isolated by J. Graham Forbes from dust of London Tube Railway. Alternaria species: Ireland. Isolated by Miss Lorain Smith from rotting tent canvas. Salmonella Derby: Isolated from tank water and from pork pies (cause of thirty-seven cases of pork poisoning). Verticillium cinceresсens: Isolated from wilting carnations in England. Vibrio El Tor: Amsterdam. Isolated by Dr. Doorenbos from Mekka pilgrim. Helminthosporium inaequale: Isolated from cranberry by C. L. Shear of Washington, D. C.

The Examination of Elderly Taxicab Drivers

There is an elaborate system of examination to ensure that the drivers of taxicabs who are advancing in life are physically fit. A satisfactory medical certificate is demanded of all original applicants for a license of all licensees who have reached the age of 50, and at each sixth year afterward until the age of 65. After that a certificate is required in the fifth year until the age of 73. After this age medical certificates must be produced every year. In addition to these regular certificates the commissioner of police may, if he thinks fit, call for the production of a further certificate at any time. The proportion of licenses withdrawn from elderly drivers on grounds of health is not large.

PARIS

(From Our Regular Correspondent)

Sept. 26, 1936.

Changes in the French Medical Curriculum

In the July 1936 bulletin of the Association pour le développement des relations médicales appears an abstract of the changes recently made in the attempt to bring the curriculum in the French medical schools abreast of the times. Before citing the essential features of these changes, it may be stated that the association has been highly successful, under the leadership of its president, Prof. Henri Hartmann, in attracting a large number of graduates to the manifold advantages of Paris and other large medical centers (Lyons, Bordeaux, Strasbourg and Montpelier) from a clinical standpoint. The office of the association is in charge of Miss Alice Hure, who speaks English fluently and is thus able to give the necessary information to those who do not speak French. The office is located in the main building of the Paris Medical School (Faculté de médecine).

As to the changes that go into effect this fall, the requirement for admission to the medical school for those who wish to practice in France or its many colonies remains the same; viz., a bachelor of arts degree from a French university. A student who simply wishes to take the courses in the medical schools without the license to practice can obtain a "diplôme universitaire" instead of a "diplôme d'Etat," or state license, the latter of which requires a French bachelor of arts degree. In several communications published last year in THE JOURNAL, some recent requirements were cited to the effect that only those born in France or its colonies or those who have been naturalized can practice here now. Fortunately, the law was not made retroactive, so that physicians and dentists practicing at the time of passage of the law in France can continue to do so.

Every first (preliminary or P. C. N.) year medical student is obliged to devote this period to a course in basic sciences (physics, chemistry and biology) at the University of Paris, which is close to the medical school. The medical course has been extended to seven years (including the preliminary basic science or P. C. N. year). As in the past, the clinical work occupies a major part in the program of the medical curriculum in France. In order to emphasize this, those students who are not able to pass the examinations for externships or internships at the large public hospitals must remain attached to some approved hospital during their final or sixth clinical year. The student can elect to spend this year in a service or hospital which specializes in some field so as to begin work as a specialist if he desires.

A noteworthy feature of the medical curriculum which surprises many who visit France is that the mornings are spent by the first and second year students at the various large public hospitals and the afternoons are devoted to anatomy, histology, embryology, physiology, medical physics and chemistry. The claim is made that the student finds that such subjects as anatomy and physiology are of more interest if he has the daily opportunity of observing the clinical application of these fundamentals of medicine. This conception of medical teaching, the report states, is less criticized now than formerly. In a number of foreign countries the question is already being discussed as to whether it is wise to wait until the third year of the curriculum before the student is given bedside instruction.

During the third and fourth years in France the curriculum now includes general and surgical pathology, bacteriology, parasitology, obstetrics, surgical anatomy, operative surgery and experimental medicine, and that of the fifth year includes hygiene, legal medicine, pharmacology and therapeutics. Attendance during periods of two or three months at clinics in general surgery, obstetrics, dermatosyphilology, psychiatry, neurology, pediatrics, contagious diseases, ophthalmology and otolaryngology is compulsory during the third, fourth and fifth years. The effort is made to have the student devote as much time as possible to those of these subjects which will be of the greatest service for general practice. The sixth or hospital year will be spent at hospitals attached to medical schools or approved institutions not so attached or even in a hospital situated in a foreign country.

The system of examinations here differs from that employed in the United States. Intermediate examinations, i. e., during the school year, are not required in any of the clinical subjects, but every student must pass an oral test and, in a few subjects, a written one, at the end of the school year (June or July). At the end of the sixth or hospital year, oral examinations before a "jury" of three professors, as well as those at the bedside, must be passed by every student. In addition, he or she must submit and be ready to defend a thesis based on research or clinical work, before a jury of three members of the faculty. After the second year, every student is eligible to take part in an examination for externships in the many large public hospitals of every large city in France. The successful candidates serve as clinical clerks but are required to pass all final examinations. In addition, an extern can become an intern with added privileges and responibilities by passing a second competitive rigid series of written examinations. Interns must agree to remain in a hospital for four years. They can select the service which they desire to enter according to their rank in the examinations. As a rule, the internship is a stepping stone to higher positions (also obtainable by competitive tests) such as chief of clinic, associate professor and professor. Thus the majority of interns become

specialists because the opportunities for work in a special field are not to be excelled, by reason of the large number of beds in each service and the well attended outpatient departments.

In the department of the Seine there are 35,000 beds in the various public medical institutions, so that about 800 externs and interns can be selected annually during the second to sixth years of the medical school curriculum. This seems a rather high percentage, but it must be recalled that there is only one medical school in Paris and that the student body averages well over 4,000 annually. Every effort is made here to create a general practitioner and not a specialist or research worker. Perhaps in the future a greater effort will be made to simplify still further the present overcharged curriculum.

The teaching personnel of the various medical schools in France must pass competitive examinations in which the ranking is based not only on the results of the written tests but also on the clinical and research work of the candidate. The same system is used for all appointments on the staffs of the public hospitals. "Agrégés," or associate professors, who thus secure their appointment by competitive examination must remain in this rank for nine years. They are then eligible to promotion to a professorship by election, after submission of a list of previous positions they have occupied and work done. Retirement is compulsory for associate professors at the age of 62 and for professors at the age of 70 years. Diplomas as specialists have been bestowed up to the present time by only a few medical schools in France and these specialties have included only physical education, hygiene, radiology and public school medicine.

Regulations for Public and Private Sanatoriums

According to a law passed by the French senate and chamber of deputies recently, every sanatorium for the treatment of pulmonary tuberculosis will be obliged to possess grounds which will suffice to permit the patients to take walks without leaving the premises under control of the institution. Such an area will be in proportion to the number of beds in the sanatorium. A private sanatorium cannot be opened without special permission of the government. This applies also to any changes in construction and increase in the number of beds. Tuberculous patients whose sanatorium costs are paid by the social insurance authorities can be treated only in institutions that are regularly licensed and not indiscriminately in any villa, hotel, boarding house or private resort.

BERLIN

(From Our Regular Correspondent)

Sept. 7, 1936.

The Increase in Diabetes Mellitus

Bertram, the Hamburg internist, recently pointed out the need for a systematic prophylaxis since diabetes is on the increase throughout the world. According to his interpretation there exists in addition to the apparent increase in the incidence of the disease, namely, that due to the prolongation of the life span and to better diagnostic and therapeutic methods, an absolute increase as well. He visualizes as responsible for this absolute increase a greater consumption of fat, the migration of the population to the cities and the decrease in bodily movement due to modern means of transportation. Almost all cases of diabetes are based on a congenital inferiority of the endocrine system (demonstrated in from 25 to 46 per cent of the cases). Bertram takes the stand that a renunciation (compulsory if need be) of procreation should be required of diabetes mellitus sufferers. For the time being, however, he discountenances sterilization, although he goes so far as to advocate the prohibition of the marriage of any diabetic persons in whom a hereditary familial predisposition is demonstrable, even among collateral relatives; he further believes that a like prohibition should apply to persons presenting fairly severe diabetes even if the familial history is negative. In cases of bilateral hereditary taint, marriage should be interdicted even if neither prospective marriage partner has as yet presented diabetes. Imperiled persons, namely, members of diabetic families, persons who experience occasional elimination of sugar, persons with renal diabetes and certain cases of obesity, should be subjected to continuous supervision. The alimentary functional test with dextrose is recommended as a test of pancreatic function.

For persons threatened with diabetes, prophylactic measures consist in regulation of the habits of life: a regimen of milk and vegetables, abstention from alcohol and tobacco and, on the other hand, participation in sports. A regular leave of absence is necessary as well as vocational guidance. Of paramount importance is the avoidance of a heavy consumption of fats. In the restriction of fat consumption lies the cause of the disappearance of diabetes during the World War. Persons in danger of diabetes should be spared any sort of mental excitement. Infections may frequently induce a diabetes as well as disorders of the gallbladder. In the latter event early operation is indicated, particularly in patients with hereditary predisposition.

Arteriosclerosis is far more likely to be presented by diabetic persons than by those whose metabolism is normal. Bertram sees the cause of this in the generally prevalent carbohydrate-deficient and fat-rich diet that leads to a permanent increase in the cholesterol content of the blood (Aschoff's imbibition theory of arteriosclerosis). The first problem in combating diabetes mellitus, particularly in the fight against acidosis, has been solved by insulin. The second problem, prevention of those arteriosclerotic changes so much more prevalent among diabetic patients than among persons of normal metabolism, can be solved, according to Bertram's theory, by a general introduction of a diet rich in carbohydrates and deficient in fats. Accordingly he administers daily at least 150 Gm. of carbohydrate and a maximum of 100 Gm. of fat. It can hardly be supposed that the enormous increase in diabetes depends on an increase in the hereditary predisposition. It appears logical and is generally assumed that the tendency to diabetes mellitus is extremely widespread and that this high incidence may be attributed to exogenic influences, principally to a diet rich in fat and deficient in carbohydrate, and to the underexercised condition of dwellers in civilized lands. If the foregoing factors are well comprehended, the outlook for a preventive attack on diabetes will appear more promising.

In discussing these observations, which were made before the Medical Society of Hamburg, one should mention the fact that Bertram's opinion with reference to the authorization of eugenic measures was by no means concurred in by a majority of his hearers or at least the sentiment was general that judgment be reserved pending further investigation. Bertram's evaluation of excessive consumption of fat in prediabetes is by no means acceptable; the increased fat with diet can be interpreted as a general expression of prediabetic polyphagia and should not be considered unqualifiedly as the cause of the pathologic development. Finally, one must think of the substantial increase in the consumption of sugar as a possible etiologic factor in the greater prevalence of diabetes. As Dr. Scholderer explained, pure sugar probably exercises an influence on metabolism, entirely disparate from that of carbohydrate, as with the latter assimilation first slowly takes place after the decomposition of vegetables.

Recent Developments in Treatment of Thyrotoxicosis

The Berlin Medical Society recently discussed the recent developments in the treatment of thyrotoxicosis from a variety of angles. Professor Siebeck, who spoke as an internist, pointed out that in those conditions of poisoning from the thyroid substance which are called thyrotoxicoses the basal metabolism

serves as a criterion neither of the quantity of these substances nor of the severity of the illness. Likewise there exists no proportionality between the basal metabolism and the iodine content of the blood. The interrelation of diseases of the central nervous system and the hypophysis must be considered as well as the reciprocal effect of the hormone storage in the thalamencephalon. Exophthalmic goiter is no true hyperthyreosis but a disease of another character from thyrotoxicosis. It should be diagnosed only on the basis of a completely developed triad of symptoms. Important in the manifestation of exophthalmic goiter is the constitutional factor, which often presents itself in anomalies of the premorbid personality. Although no specific psychogenic factors are present in exophthalmic goiter, frequent appearances of the illness subsequent to psychic traumas, and especially after those of an erotic nature, have been observed. In the introduction of therapeutic measures a general preliminary treatment and a specific therapy must be differentiated. Of the greatest importance are an adequate psychic quieting, a nonfattening diet rich in carbohydrates with fruit days interpolated and, in addition, phenobarbital. Siebeck observed no particular benefit from administration of vitamin A, though a decrease in the iodine content of the blood and the basal metabolism can frequently be obtained by use of vitamin C. These preliminary measures form the basis of any therapeutic approach and in the milder cases they alone will suffice. The quieting of the patient helps to correct the abnormal activity of the thyroid body. Siebeck considers iodotherapy as the specific treatment. In the coma of exophthalmic goiter, improvement, although manifestly not steady, is observed after large dosages of iodine. The success of iodotherapy depends not on the amount of the dosage but on the preliminary treatment. Individual reactions to iodine vary. Diiodotyrosine, in corresponding doses, produces virtually the same reaction as inorganic iodine and this leads Siebeck to doubt that diiodotyrosine possesses an antagonistic action toward thyroxine. A further parallel to iodine is to be found in the unreliability of the result. Still, diiodotyrosine is innocuous as a therapeutic substance. Digitalis exercises a beneficial effect on the circulation only if administered in large doses and subsequent to the introduction of the general preliminary treatment and iodotherapy. Continued use of quinidine may even do away with pronounced arrhythmias. The permanently successful results of internistic therapy cannot be favorably compared with the results from operative therapy. Surgical intervention is indicated in all quite severe or reasonably severe cases, the patient's general condition being considered the criterion. The operation is dangerous only if the preliminary treatment has been inadequate. The effects of roentgen irradiation are uncertain and even dangerous, favorable reports notwithstanding. Radiotherapy is an innocuous but extremely protracted procedure.

The work of the surgical clinic (Sauerbruch) appears of particular importance in this connection. The preliminary measures correspond roughly to those outlined; the most favorable results are obtained in cases of diffuse, soft, pulsating goiter. Sauerbruch himself discussed some innovations in the surgery of the thyroid body. The results of operative treatment are unquestionably more satisfactory than formerly. In contrast to hyperthyreosis, exophthalmic goiter is a disease of the entire personality which commences with disturbance of the nervous system. Sauerbruch does not perform operations on patients newly come down with exophthalmic goiter. To be differentiated from the psychic form of exophthalmic goiter is thyroid disease induced by a primary disturbance of the endocrine system. The so-called secondary types, toxic thyroid adenomas and thyroid hyperplasias, which frequently appear subsequent to a thyroiditis, are not to be regarded as genuine exophthalmic goiters. Of paramount importance in true exophthalmic goiter is the determination of the optimal time for operative intervention. As a rule operation should be performed from two to three months after the psychic trauma. Early operative treatment can still heal exophthalmic goiter, since it acts before the changes have become permanent. Moreover, operation for exophthalmic goiter never can be considered a causal therapy. The operation itself is not dangerous if performed under local anesthesia after suitable preliminary psychotherapy, although it gradually has tended to become more radical. The mortality for 294 operations on patients presenting fully developed exophthalmic goiter performed at the Sauerbruch clinic has sunk below 6 per cent; for operations on patients with hyperthyreosis it amounts to only 1 per cent. Irradiation renders the eventually necessary operation more difficult by inducing hyperemia of the capsule; moreover, it is responsible for a mortality of from 14 to 18 per cent. Finally one should remember that there is also a type of hyperthyroidism without goiter; in such cases there is a retrosternal struma.

BELGIUM

(From Our Regular Correspondent)

Sept. 1, 1936.

Opposition to Women in Competitive Athletics

The commission that has been studying the question of feminine participation in sports has just published a report which may be summarized as follows: Like men, women should be adequately trained to participate in sports by a course of preliminary physical education beginning in childhood; they should be subjected to a rigorous process of classification together with prudent measures for individual orientation. Furthermore, before, during and after the training period and the athletic contest a woman participant should submit voluntarily to medical supervision. A woman may, without danger, undergo the training procedures of a majority of sports. Yet there is no question that those fiercely competitive athletic contests wherein the contestant seeks to make the maximum effort, *per fas et nefas,* may prove harmful to the female athlete since she lacks the muscular force of the male and her organism cannot endure maltreatment with the same impunity as that enjoyed by the male. The female is less able than the male to undergo severe physical and nervous strain, the risk of certain traumas, notably of the thorax and of the abdomen, and the harsh rough and tumble inseparable from certain types of jumping and from certain games.

We consider therefore that only when the greatest precautions have been taken should women participate in high speed racing events (such as foot, swimming, rowing, cycling and skating races). Women should avoid those sports which demand the utilization in a relatively short time of all the organism's reserves; they should not participate in violent and rough jumping in which the fall cannot be broken, nor should they habitually engage in exercises that involve suspension by and leaning on the arms.

There is no doubt that at present all these questions are far from being definitively solved. It is to be hoped that women themselves will undertake to investigate the varied and complex effects of different types of physical exercise and that sportswomen, women athletes and women in general (be they teachers, physicians or professors of physical education) will further interest themselves in these questions so fundamental both for themselves and for the race.

From the standpoint of hygiene, we continue to be opposed to the participation of women in competitive games. We believe, however, that because of its benefit as general propaganda for physical education a certain amount of such participation should be tolerated. But, we repeat, the importance of a con-

stant and strict medical supervision cannot be overestimated. The observations made at the time of these medical examinations shall permit the assembly in the near future of sufficient material on which to base more exact opinion with regard to which sports should be approved for women and which interdicted. Meanwhile the following division may be accepted as tentative: Sports in which women should not participate are boxing, wrestling, exercises with dumb-bells, football, ice hockey, bicycle racing, pole vaulting, foot racing and ski jumping. Sports in which women may participate are tennis, handball, basketball, cricket, swimming, boating, equitation, golf, lacrosse, field hockey, fencing, skiing (without the jumps), skating and javelin hurling.

New Regulations for the Preparation of Bottled Drinking Water

A new ordinance concerning the preparation of drinking water has just been passed. It is an attempt to regulate the delivery pipes, conduits, water tanks and reservoirs so that all possibility of contamination will be excluded. The flow from the conduits must be in proportion to the actual supply used. The working premises shall be reserved exclusively for the manufacture, preparation, placing in receptacles and disinfecting of the utensils and receptacles. These premises as well as the place of storage of the finished products must not communicate directly with any stable or barn, or with any toilet, pits for manure, cesspool or place of deposit for decomposing organic matter. The working premises shall be well lighted and well ventilated, kept in suitable condition and arranged so as to permit the rapid efflux of the water; the walls shall be constructed of tile or redecorated with waterproof plaster. The apparatus and the premises shall be washed and cleaned out each day with abundant water immediately following working hours. Even for washing, none but sanitary water shall be used. Carbonating appliances that employ pressure shall be subjected, previous to being placed in use, to a test pressure 50 per cent greater than that which would be required in the ordinary course of operation. They shall, in addition, be equipped with a device calculated to prevent the limit of pressure from being exceeded.

In the preparation and bottling of table waters destined to be placed on sale, and in the commercial manufacture and preparation of ices and lemonades, the following are forbidden: 1. Any apparatus, utensils or receptacles that are soiled or in which the parts in contact with the product are made of wood or contain substances that are poisonous or injurious to the health. 2. Bottles or other receptacles that have not been, immediately prior to filling, thoroughly cleansed or sterilized, rinsed with water pure enough for drinking purposes and emptied again. The washing of receptacles both outside and inside must take place before every filling and in such a way as to remove all impurities and deposits. This washing process must be followed by an abundant flushing with constantly renewed pure water. The bottling shall be immediately followed by the stoppering and capping. These processes must be effected by means of a device that is not in direct contact with the receptacles.

Persons employed in the preparation of drinking waters must be free from infectious disease; they must further be properly attired and scrupulously clean, above all with reference to the hands and nails. It is forbidden to prepare or to place in receptacles for marketing any water that does not come from a spring, a reservoir, a well or a public water main. The same prohibition applies to the commercial manufacture and preparation of ices or lemonades. Water must not be brought to the preparation and bottling plant except by an air-tight channel connecting directly with the reservoir, well or stream. In the commercial preparation of table water and lemonades and in the manufacture of ices the use of the following is forbidden: (1) poisonous substances, (2) substances that have been declared noxious by the proper supervisory authorities, (3) antiseptics, (4) saponins, (5) mineral acids and (6) carbonic anhydride containing nitrogen, sulfur and hydrocarbon derivatives.

Silicosis Among Glassmakers

Drs. Courtois and Leclercq have reported to the Belgian Society for Tuberculosis Research the results of their observation of glassmakers in the Charleroi region. The nature of the work and the working conditions are described. Among the plants investigated was a glass factory at Jumet in which the old procedures of gathering and blowing were still employed for the manufacture of colored glass. As a matter of fact, the entire report resolved itself into a consideration of the manufacture of glass in the old way, the workers examined being for the most part elderly persons who had learned their métier before the advent of machine-made glass.

The atmosphere of the glass works seemed to contain only a small quantity of dusts and gas, except in the drying room, where conditions appeared more unhealthful. The lesser degree of active combustion in the ovens in this room made it possible that incompletely burned gases such as carbon monoxide might be inhaled together with sooty dusts. It was further observed that the beating process involved an exposure to inhalation of sand particles.

An exhaustive analysis of these dusts showed the particles to be relatively large, so large in fact that only 1.4 per cent of the particles were less than 10 microns in diameter (the maximal dimension of any object that could find its way into the lower respiratory passages).

An examination was made of eighteen workers, including five glass-blowers (representing forty-one, forty, thirty-six, twenty-seven and twenty-six years of work), three gatherers (thirty-six, thirty-five and twenty-five years of work), five cutters (thirty-six, thirty-six, twenty-three, twelve and ten years of work), two grinders (twenty-four and twenty years of work), one storekeeper (fifty years of work), one gas man (twenty-five years of work), one beveling assistant (fifty years of work). The investigation disclosed only one case of silicosis and this was in a man aged 61, who presented the classic clinical, physical and radiologic syndrome: cough, expectoration of mucus, dyspnea, and scattered dry and sibilant râles, the roentgenogram showing the entire pulmonary region studded with extremely fine nodular opacities. The authors, however, still found it necessary to make reservations with regard to this single case, since diagnosis must be "etiologic" as well as clinical and radiologic and here, strangely enough, the apparent victim of silicosis was the storekeeper who for fifty years had worked in the least unhealthful spot of the glass factory (the warehouse).

Silicosis then may possibly occur as an occupational disease among glassworkers, although such cases are extremely rare. The fact evidenced by statistics that many glassworkers die prematurely cannot therefore be attributed to silicosis but quite decidedly to the cardiopulmonary disorders to which their métier particularly exposes them and with which they appear so frequently to be afflicted. Tuberculosis, like silicosis, is seldom encountered among this group. One should remember that glassworkers formerly constituted a sort of aristocracy among the working class; they were well paid, well fed and well housed. Hence the social background fails to present the pathogenic factors that underlie the manifestation of infectious bronchopulmonary diseases.

In concluding their discussion, the authors emphasize the complexity of the diagnostic problem in silicosis research, even when the disease is definitely recognized as occupational in origin.

Marriages

ROBERT EDWIN WRIGHT, East Orange, N. J., to Miss Marjorie Eloise Coffman of Orange at Glen Ridge, August 22.

EARL S. HALLINGER JR., Wildwood, N. J., to Miss Sylvia Hoffman of Cleveland at Harrison, N. Y., September 23.

WILLIAM K. SENNETT, Macy, Ind., to Miss Gladys Baxter of Shelbourne in Indianapolis, September 17.

FRANK HART PETERS to Miss Madeleine Henriques, both of New York, in Princeton, N. J., September 5.

ROBERT JEROME PARSONS, New York, to Miss Fannie Bach of New Canaan, Conn., September 12.

JAMES GRAHAM SHAW, Columbia, S. C., to Miss Marie Lee Keiley of Richmond, Va., August 28.

PAUL ANTHONY O'CONNOR to Miss Katherine Fissell, both of Newark, N. J., August 22.

CARL M. PORTER, Jasonville, Ind., to Miss Rosalind English of Clay City recently.

Deaths

James Clifford Perry ⊕ Medical Director, U. S. Public Health Service, San Francisco; University of Maryland School of Medicine, Baltimore, 1885; was appointed assistant surgeon in 1889, passed assistant surgeon in 1893, surgeon in 1904, senior surgeon in 1915, assistant surgeon general in 1918 and since 1930 medical director of the U. S. Public Health Service; organized a protective quarantine at Hongkong, China, in 1899 governing vessels for the United States ports; organized quarantine service in the Philippine Islands and was chief quarantine officer from 1900 to 1903; served as chief quarantine officer on the sanitary staff of the Isthmian Canal Commission from 1905 to 1914; was health officer of the City of Panama from 1909 to 1914; later made special investigations in Chicago, Richmond, Ind., and Columbia, S. C., and served as chief medical officer at Ellis Island; member of the American Public Health Association and the Society of Tropical Medicine and Hygiene of London; aged 73; died suddenly, October 19, on the steamship *District of Columbia*.

Frederick William Marlow, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1900; L.R.C.P., London, and M.R.C.S., England, 1902; F.R.C.S., England, 1903; in 1913 was appointed associate professor of gynecology, and from 1903 to 1906 demonstrator of anatomy at the University of Toronto Faculty of Medicine; past president of the Ontario Medical Association and the Academy of Medicine; one of the founders and fellow of the American College of Surgeons; served with the Canadian army during the World War; senior attending gynecologist to the Toronto General Hospital; member of the surgical staffs of St. John's and the Wellesley hospitals; aged 59; died, August 22, at Knollview, his farm in Scarboro.

Homer Dupuy ⊕ New Orleans; Tulane University of Louisiana Medical Department, New Orleans, 1897; professor of otorhinolaryngology, Louisiana State University Medical Center; assistant professor of otorhinolaryngology, New Orleans Polyclinic, from 1900 to 1915; professor of oral surgery, Loyola University, from 1925 to 1930; past president of the Louisiana State Medical Society and the Orleans Parish Medical Society; assistant surgeon, Ear, Nose and Throat Hospital, from 1899 to 1915; senior visiting surgeon, division of otorhinolaryngology, State Charity Hospital, since 1915; aged 65; died, September 28.

John English McWhorter, Tenafly, N. J.; Columbia University College of Physicians and Surgeons, New York, 1898; assistant professor of clinical surgery at his alma mater and assistant professor of surgery, University and Bellevue Hospital Medical College, New York; member of the American Association of Pathologists and Bacteriologists; surgical pathologist to the Bellevue Hospital, pathologist to the French Hospital and Hospital for Ruptured and Crippled; consulting pathologist to the Home for Incurables, New York, and Englewood (N. J.) Hospital; aged 61; died, September 19.

Albert Belcham Keyes, Chicago; Chicago Medical College, 1890; formerly assistant professor of obstetrics and gynecology, Rush Medical College, and professor of gynecology at the Chicago Policlinic; fellow of the American College of Surgeons; served during the World War; gynecologist to the Henrotin Hospital and the Chicago Maternity Hospital; aged 74; died, October 11, at his home in Evanston, Ill., of cerebral thrombosis.

Howard Earl Marchbanks ⊕ Pittsburg, Kan.; University of Kansas School of Medicine, Kansas City, 1916; member of the Central Society of Clinical Research; fellow of the American College of Physicians; chairman of the medical advisory board of the Crawford County Red Cross; served during the World War; on the staff of the Mount Carmel Hospital; aged 48; died, August 7, of coronary occlusion.

Bernhard Ernst Knolle, Industry, Texas; Tulane University of Louisiana Medical Department, New Orleans, 1886; past president of the Austin County Medical Society; formerly county health officer; president of the board of trustees of the school board; president of the staff of the Sarah B. Milroy Memorial Hospital, Brenham; aged 69; died, August 20, of peritonitis following appendicitis.

Arthur J. Puls, Milwaukee; Universität Heidelberg Medizinische Fakultät, Heidelberg, Baden, Germany, 1883; fellow of the American College of Surgeons; gynecologist to the Columbia Hospital and the Milwaukee County Dispensary; member of the board of regents of the University of Wisconsin, Madison, from 1902 to 1908; aged 79; died, August 10, of carcinoma of the prostate.

William R. Quick, Delphi, Ind.; Kentucky School of Medicine, Louisville, 1891; member of the Indiana State Medical Association; formerly secretary of the Carroll County Medical Society; member of the school board; city health officer, and at one time county health officer; aged 74; died, August 20, in a hospital at Lafayette, of carcinoma of the bladder with metastasis.

James Albert Knox ⊕ Waynesburg, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1903; past president of the Greene County Medical Society; member of the staff of the board of directors of the Greene County Memorial Hospital; bank president; member of the board of directors of the Waynesburg College; aged 58; died suddenly, August 10, of acute coronary thrombosis.

John Ralph Neely, Spokane, Wash.; Howard University College of Medicine, Washington, D. C., 1887; Georgetown University School of Medicine, Washington, D. C., 1891; member of the Washington State Medical Association; for many years a member of the city health department; aged 77; died recently in London, England, of heart disease and diabetes mellitus.

William Henry Jamieson ⊕ Ottawa, Ill.; Rush Medical College, Chicago, 1910; president of the medical staff of the Ryburn Memorial Hospital; formerly on the staff of the Ottawa Tuberculosis Sanatorium; member of the school board; aged 59; died, August 9, in the State of Wisconsin General Hospital, Madison, of coronary thrombosis.

Eugene Clower, Cairo, Ga.; Atlanta College of Physicians and Surgeons, 1902; member of the Medical Association of Georgia; past president of the Grady County Medical Society; on the associate staff of the John D. Archbold Memorial Hospital, Thomasville; aged 60; died, August 19, of cerebral hemorrhage.

Seymour Rowland Lee, St. Paul; University of Illinois College of Medicine, Chicago, 1927; member of the Minnesota State Medical Association; superintendent of the Ancker Hospital and formerly superintendent of the Willmar (Minn.) State Asylum; aged 36; died, August 10, following an operation for appendicitis.

Uriah Agrippa James, Pittston, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1899; member of the Medical Society of the State of Pennsylvania; on the staff of the Pittston Hospital; aged 58; died suddenly, August 3, at his summer home at Lake Winola, of coronary thrombosis.

Emerson William Goldman, Madison, S. D.; Lincoln (Neb.) Medical College of Cotner University, 1903; member of the South Dakota State Medical Association; state senator; on the staff of the Madison Community Hospital; aged 56; died, August 8, of chronic myocarditis.

Jacob Livingston ⊕ Newark, N. J.; Johns Hopkins University School of Medicine, Baltimore, 1920; on the staffs of the Beth Israel and Presbyterian hospitals; aged 42; was drowned, August 23, at Lake Hopatcong, when he fell accidentally from his motor boat.

Thomas Mortimer Lloyd, New York; University of Pennsylvania Department of Medicine, Philadelphia, 1876; at one time on the staff of St. Peter's Hospital, Brooklyn; aged 81; died, August 21, in Bellport, L. I., of carcinoma of the prostate and diabetes mellitus.

James Arthur Sullivan Howell, Elgin, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1891; served during the World War; aged 65; died, August 18, in St. Joseph's Hospital, of carcinoma of the prostate.

William Wooldredge Dodge, Hamilton, Mass.; Harvard University Medical School, Boston, 1886; member of the Massachusetts Medical Society; aged 79; died, August 11, in the Beverly (Mass.) Hospital, of arteriosclerosis and bronchopneumonia.

Theophilus Lacy Mastin, Huntsville, Ala.; University of Pennsylvania Department of Medicine, Philadelphia, 1902; member of the Medical Association of the State of Alabama; aged 62; died, August 3, in the Huntsville Hospital, of uremia.

William A. Martens, Milwaukee; Milwaukee Medical College, 1903; member of the State Medical Society of Wisconsin; aged 58; died, August 3, in Rochester, Minn., of subdural hemorrhage due to an automobile accident, and bronchopneumonia.

John T. Freeman, Finley, Tenn.; Mississippi Medical College, Meridian, 1910; member of the Tennessee State Medical Association; county health officer; chairman of the county school board; aged 50; died, August 7, of cerebral hemorrhage.

William Elias Hedges, Portland, Ore.; Chicago Homeopathic Medical College, 1904; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; aged 61; died, August 8, of coronary occlusion.

William Humphrey Drewry, Charlotte, N. C.; Medical College of Virginia, Richmond, 1926; member of the Medical Society of the State of North Carolina; aged 35; died, October 1, in a local hospital, following an operation for appendicitis.

Carl Ludvick Sandberg ✠ Salt Lake City; Northwestern University Medical School, Chicago, 1908; veteran of the Spanish-American and World wars; on the staff of St. Mark's Hospital; aged 58; died, August 14, of coronary occlusion.

John Robert Hicks, Tulare, Calif.; Central College of Physicians and Surgeons, Indianapolis, 1897; member of the California Medical Association; at one time a member of the state board of health of Indiana; aged 65; died, August 1.

Thomas Edward Hoxsey ✠ Spokane, Wash.; Barnes Medical College, St. Louis, 1900; aged 62; on the staffs of the Sacred Heart Hospital and the Deaconess Hospital, where he died, August 23, of coronary occlusion and hypertension.

Marcus Keen Mines, Camden, N. J.; Jefferson Medical College of Philadelphia, 1892; at one time chairman of the city board of health; formerly on the staff of the Municipal Hospital; aged 67; died, August 25, of myocarditis.

Corwin Luctus Maxwell ✠ Myra, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1898; past president of the Cooke County Medical Society; aged 65; died, August 18, of carcinoma of the gallbladder.

George Marcus Crowell, Suncook, N. H.; Harvard University Medical School, Boston, 1899; member of the New Hampshire Medical Society; aged 64; died, August 11, in Pembroke of organic heart disease.

Clarence Edwin Gourley, Mingo Junction, Ohio; Ohio Medical University, Columbus, 1903; member of the Ohio State Medical Association; for many years a member of the school board; aged 60; died, August 11.

Samuel Howard Ezzell, Lancaster, S. C.; Atlanta College of Physicians and Surgeons, 1900; member of the South Carolina Medical Association; aged 64; died, September 23, in a hospital at Rock Hill, of uremia.

Arthur Everett McCarthy, Buffalo; University of Buffalo School of Medicine, 1899; served during the World War; aged 59; died, August 6, in the Buffalo General Hospital, of carcinoma of the sigmoid.

Lucy MacMillan Elliott Guldbrandsen, Oakland, Calif.; University of Michigan Medical School, Ann Arbor, 1915; aged 50; died, August 18, in the University of California Hospital, San Francisco.

Leonard Eric de Chantal ✠ Wallingford, Conn.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1918; aged 46; died, August 2, in Albuquerque, N. M., of pulmonary tuberculosis.

Savala Eustace Gunn ✠ Hopewell, Va.; Medical College of Virginia, Richmond, 1926; served during the World War; aged 44; died, August 26, in a hospital at Petersburg, of acute pancreatitis.

William Francis Hager ✠ Pana, Ill.; Barnes Medical College, St. Louis, 1908 and 1909; on the staff of the Huber Memorial Hospital; aged 55; died, August 10, of coronary thrombosis.

Charles T. Dyess, Clewiston, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; aged 53; died, August 19, in Fort Myers, of pernicious malaria and hepatic cirrhosis.

William Frederick Aloysius Gillan, Quincy, Mass.; Tufts College Medical School, Boston, 1898; aged 72; died, August 14, in the Quincy City Hospital, of myocarditis and arteriosclerosis.

Charles Parker Maddux, Imola, Calif.; Cooper Medical College, San Francisco, 1898; on the staff of the Napa State Hospital; aged 64; died, July 3, of myocarditis and arteriosclerosis.

Guel George Morehouse, Owatonna, Minn.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1902; aged 59; was found dead in bed, August 31, of chronic myocarditis.

Louis Augustus Sanders, Hazelrigg, Ind.; Medical College of Indiana, Indianapolis, 1888; formerly county health officer; aged 82; died, August 10, of carcinoma of the prostate.

Marcus C. Hunter, Huntersville, N. C.; College of Physicians and Surgeons, Baltimore, 1882; for many years bank president; aged 78; died, August 3, of myocarditis and uremia.

John S. Ragan, Plainfield, Ind.; Medical College of Indiana, Indianapolis, 1879; for many years physician to the Indiana Boys School; aged 87; died August 20, of arteriosclerosis.

Augustus M. Johnson, Arenzville, Ill.; St. Louis College of Physicians and Surgeons, 1898; aged 61; died, August 14, in a hospital at Beardstown, of multiple cerebral infarcts.

Ira Timothy Johnson ✠ Rochester, N. Y.; Bellevue Hospital Medical College, New York, 1889; aged 73; died, August 4, of carcinoma of the larynx and acute myocarditis.

John Kerr Crawford, Somerville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1904; aged 58; died, August 7, in a local hospital of cholecystitis.

Grape Frank Keller, Oklahoma City; University of Oklahoma School of Medicine, Oklahoma City, 1934; aged 44; died, August 12, in a local hospital, of septicemia.

Enos H. Leaman, Philadelphia; Temple University School of Medicine, Philadelphia, 1910; aged 69; died, August 8, of paralysis agitans and cardiovascular disease.

Joseph B. Chapman, Seattle; Washington Biochemic Medical College, North Yakima, 1889; aged 73; died, August 15, of cerebral hemorrhage and arteriosclerosis.

Edward Newton Flint, Chicago; College of Physicians and Surgeons of Chicago, 1887; aged 72; died, August 31, at the Ravenswood Hospital, of myocarditis.

George Shelley Everhart, Hagerstown, Md.; Southern Homeopathic Medical College, Baltimore, 1897; aged 65; died, August 21, as the result of mastoiditis.

Simon W. Royer, Wichita, Kan.; Kansas City Homeopathic Medical College, 1894; aged 83; was found dead, August 14, of coronary thrombosis.

Seymour F. Hinson, Newbern, Tenn.; University of Tennessee Medical Department, Nashville, 1899; aged 65; died, August 3, of coronary thrombosis.

Mary Grace Haskins, Bridgewater, Conn.; Woman's Medical College of Pennsylvania, Philadelphia, 1901; died, August 1, of cerebral thrombosis.

William Bradley Brock, Oakville, Iowa; College of Physicians and Surgeons of Chicago, 1886; aged 75; died, August 26, of coronary thrombosis.

Arthur C. Sells, Aledo, Ill.; Keokuk (Iowa) Medical College, 1892; member of the Illinois State Medical Society; aged 65; died, July 10.

Henry Farrell ✠ McCook, Neb.; Baltimore Medical College, 1907; aged 58; died, August 3, of coronary occlusion and diabetes mellitus.

Joseph E. Schallmo, Chicago; Loyola University School of Medicine, Chicago, 1916; aged 62; died, August 5, of chronic myocarditis.

William M. Boone, Highland, Kan.; College of Physicians and Surgeons, Baltimore, 1891; aged 76; died, August 6, of coronary occlusion.

Alvin McPhee Warner, Vancouver, B. C., Canada; Queen's University Faculty of Medicine, Kingston, Ont., 1912; aged 52; died, July 18.

Herbert Marcus McKenzie, Evansville, Ind.; Rush Medical College, 1874; aged 85; died, July 15.

Correspondence

NECROSPERMIA AND VIABILITY OF SPERMATOZOA IN THE CERVICAL CANAL

To the Editor:—It is now over twenty years since my book on sterility (Sterility in the Male and Female, New York, Rebman Company, 1913) was published in which I gave the results and statistics of my study of the behavior of spermatozoa in the female genitals in hundreds of cases in normal and pathologic conditions of the female genitals. This was the first attempt ever made to study spermatozoa in the female genitals in a systematic manner and in a large number of cases, although a few observations had been made by previous writers. This book was followed by various articles in medical journals and culminated in using this method in the diagnosis of both male and female sterility. This procedure I designated as the cervix test (The Practical, Scientific Diagnosis and Treatment of Sterility in the Male and Female, *M. Rec.*, May 9, 1914) and later as the spermatozoa test (The Value of the Spermatozoa Test in Sterility, *Urol. & Cutan. Rev.* November 1914) but Reynolds in 1915 (Reynolds, Edward: Prognosis of Sterility, THE JOURNAL, Oct. 2, 1915, p. 1151) referred to it as the Huhner test, by which name it is now known not only in America but also abroad.

In the May 16 (p. 1728) issue of THE JOURNAL appears a preliminary report by Dr. Frances I. Seymour on the "Viability of Spermatozoa in the Cervical Canal." My observations were made at various periods after coitus and have the distinct advantage of testing the husband's semen in the genitals of his own wife. After all, in the vast preponderance of cases, pregnancy is the result of coitus between husband and wife, and such observations therefore are of much greater value than if made after the unusual procedure of artificial insemination. All my observations were made in cases of sterility and I succeeded in finding live spermatozoa in the cervix of a woman five days after coitus and dead ones in the fundus as long as seven days after coitus.

The writer apparently tried to relieve sterility by artificial impregnation, using semen from some one not the husband of the patient. I have had the same request made to me by many an anxious patient with sterility but always refused. Not only must it be determined beyond the question of a doubt that the donor is free from gonorrhea and syphilis, but one must know the entire life history not only of the donor but also of his ancestry to rule out such conditions as insanity and epilepsy. To my mind the bringing into existence of a new life is a solemn and serious problem, and the fact that a certain donor is a good breeder adds nothing to our scientific knowledge as we often see about us numerous instances in which a husband is constantly impregnating his wife.

I wish to commend the doctor in making the injections only into the cervix and not into the fundus. The injection of semen into the fundus is a more or less risky procedure, as there exists no known method of sterilizing semen without killing the spermatozoa. I believe that in the ordinary act of coitus the cervical secretions seem to have the power to keep back most of the ordinary bacteria which may accompany the semen and allow only the spermatozoa to pass upward. What we want to know from a purely practical standpoint is what happens to spermatozoa which enter the female genitals during ordinary coitus, and not what happens to them if brought in by the artificial method of a cannula. Obviously, in the preponderance of cases, pregnancy follows ordinary intercourse.

Coming now to the article by Dr. Cary which appeared in the June 27 issue (p. 2221) of THE JOURNAL, I wish to call attention to one important point which Dr. Cary cites in disagreement with the conclusions made by me in my observations. Dr. Cary states (p. 2222) that in 1929 he was inclined to agree with me that active sperm cells in the cervical mucus indicated the fertility of the husband, but at present he doubts this conclusion for the reason that motile sperm cells have been found in cases in which a direct male specimen was considered as deficient. This is certainly an interesting statement in view of the fact that my article "Methods of Examining for Spermatozoa in the Diagnosis and Treatment of Sterility" published in the *New York Medical Journal*, May 4, 1921, called attention to this very fact, citing it as a distinct value of my test as compared to a condom examination. For over twenty years I have been emphasizing that no complex chemical examination of the female genital secretions, no watching the spermatozoa under the artificial conditions of the microscopic stage, no counting of abnormal spermatozoa can give the practical information regarding the value of the seminal secretion in fertility compared to that of the direct examination of the spermatozoa procured from the female genitals after connection. Many years ago I cited cases in which I removed live spermatozoa from the female cervix many days after coitus, and yet these very spermatozoa died quite rapidly on the microscopic slide. Were we to judge from the behavior of these spermatozoa on the slide under the microscope we would put them down as of very poor quality, yet the fact that they had retained their vitality within the female genitals for days shows that they were of good vitality. True, experiments in animals seem to indicate that motility and fecundating power in spermatozoa are not synonymous, yet this fact cannot vitiate the results and observations mentioned.

I wish to record a most important observation concerning spermatozoa as evinced in one of the most disappointing conditions met by the specialist; namely, that of necrospermia. The cause of necrospermia may at times challenge the most painstaking investigations of the male sex organs. At times one does find a markedly congested prostate and prostatic urethra, the relief of such congestions being followed by the cure of the necrospermia. But such cases are by far in the minority. At times one meets cases that are apparently testicular in origin, for large doses of the anterior lobe of pituitary extract relieves the condition. There are of course cases of artificial necrospermia to which I have frequently called attention, namely, those instances in which the patient, in his enthusiasm to prevent the condom specimen from becoming too cold, either puts the condom containing the specimen in a jar of supposedly warm water while en route or puts the condom enclosed in a towel on a warm radiator or hot water bag. In all these cases the heat is much higher than anticipated and all the spermatozoa are dead when they reach the office. I have for many years called attention to this artificial necrospermia and have emphasized the fact that, while spermatozoa may stand a large amount of cold, the least amount of heat above the normal will kill them at once and permanently. Then once in a while a case appears in which the necrospermia is caused by some powder which the condom manufacturer has placed in it to ensure its easy application. For many years I have advised my patients to wash the interior of the condom to get rid of any possible obnoxious powder. But the fact remains that even if all these causes have been eliminated there still remains the largest number of cases of necrospermia in which the most painstaking examination will neither determine the cause nor will a cure of this condition be achieved by any method of treatment.

The up-to-date gynecologist at present will refuse to treat any woman for sterility (in the absence of any other symptom) before he is certain that the husband is normal. He therefore examines a condom specimen, and when he finds that all the spermatozoa therein are dead he advises the patient to have

her husband examined by a urologist to get rid of this important impediment to conception. But, as previously mentioned, the urologist in the vast majority of cases fails either to find the cause or to cure the condition.

I have found quite a few cases in which others as well as myself have repeatedly examined many condom specimens under the most favorable conditions and with all due precaution but always found only dead spermatozoa (even though the specimen was examined within twenty minutes of coitus) and yet a postcoital examination showed numerous normal spermatozoa. In some of these cases the spermatozoa removed from the female genitals after coitus remained alive for several hours under the microscope and yet the direct condom specimen examined only twenty minutes after coitus showed only dead spermatozoa. It may be that in some cases there is an antagonism between the material the condom is made of and the spermatozoa, although in several cases I have advised the patient to use an entirely different brand of condom without result. It may also be that in these particular cases the mere shaking up of the condom contents while en route may have the deleterious effect, although in thousands of other condom specimens examined by me and subjected to greater agitation no disturbance of the motility of spermatozoa was noticed.

I have had cases in which the woman had sought relief for her sterility for a long time, but, as this was the sole symptom, the experienced gynecologist wisely refused to do anything as long as it appeared that the husband was obviously at fault. In some cases the gynecologist easily diagnosed a more or less infantile or undeveloped state of the female sex organs, but it would be unwise to try to overcome this condition which might necessitate months of treatment as well as expensive endocrine injections when the husband appeared to be obviously at fault and the condition in the wife caused absolutely no annoyance aside from the sterility. It may therefore be laid down as an axiom that in every case of necrospermia a Huhner test should be made to establish a definite diagnosis.

This observation adds another interesting chapter to the contention I have so often made that no observation of a condom specimen, no matter by what method examined, can give such a definite diagnosis as can be made in many cases by examining the spermatozoa removed from the female genitals after coitus.

MAX HUHNER, M.D., New York.

EFFECTS OF BENZEDRINE ON BLOOD PRESSURE

To the Editor:—Of possible interest to medical examiners for life insurance companies is this personal experience: In applying for additional insurance I had the usual examination, but the policy applied for was refused on the basis of hypertension. Blood pressure examinations had been made in New York and in Chicago at frequent intervals for several years in the past and ran about 135/88. The age is 55. When the adverse report was made, a rereading from the first found, 160/98, gave 140/90 the following day. Subsequent readings ran along 135-138 systolic. Because of nasal congestion, I have used various commercial vasoconstricting preparations, such as ephedrine, epinephrine and more recently a volatile drug introduced by breathing through a small tube, made by a well known Philadelphia pharmaceutical house. As an experiment I used this tube according to directions and had my blood pressure read by the original medical examiner, who found it 172/105. Two days later it was 135/87. The record of "frank hypertension" remains on the books of the insurance clearing house, but a policy has been issued as applied for because the physicians are convinced that the nasal drug was the source of the anomaly.

WITHROW MORSE, PH.D., Chicago.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

EFFECTS OF TIN CONTAINER ON CANNED FRUITS AND VEGETABLES

To the Editor:—Can you give me the scientific evidence either confirming or refuting the popular belief that any canned goods (meat, vegetables, fruit juices) if left in the original container will develop toxic properties for that reason? It seems to be the custom to empty any "tin" can as soon as opened and put its contents into some much less sterile container. Outside of the possible addition of a few iron oxides, is there any absorption of heavy metals from the can? Please omit name if published.

M.D., District of Columbia.

ANSWER.—Spoilage is caused by bacteria, yeasts or molds, everywhere present in the air and often carried on the hands of those handling the foods. So long as food is in a can that is sealed air tight, it cannot be contaminated. Open the can and the food is at once exposed to contamination from the air and from the handling it receives. Putting the food in an open earthenware, glass or enamel vessel, even though that vessel is thoroughly cleansed, does not protect it against the spoilage organisms in the air. Such food in open vessels will spoil just as quickly as if it were left in the open can.

Food cans are made of sheet iron, coated with a thin layer of tin. Some acid foods, such as grapefruit, peaches, pineapples and tomatoes, if left in a can when exposed to the air, tend to act on the metal of the can. Dissolved iron may give the contents of the can a slightly astringent or "metallic" taste. Any tin dissolved in the food would have no taste, and even if all the tin on the inside of the can were dissolved the amount of tin which the food would contain would be small and there is no evidence that such tin compounds as may be present in canned foods are harmful.

The U. S. Department of Agriculture has recently made a study of the effects of feeding canned foods containing known amounts of tin. The results of this work have been summarized as follows by the Bureau of Chemistry and Soils: "Our own experimental work, involving the ingestion of far larger amounts of tin than any previously reported, and supported by the experimental evidence of other investigators, leads us to the conclusion that tin, in the amounts ordinarily found in canned foods and in the quantity which would be ingested in the ordinary individual diet, is for all practical purposes eliminated and is not productive of harmful effects to the consumer of canned foods."

NOCTURIA

To the Editor:—Can you suggest something for symptomatic relief of persistent, sleep-shattering nocturia? I realize that the primary aim is to treat the cause (high blood pressure, bronchiectasis, nephritis, and so on) but the usual measures for these have not been entirely successful, and the patient begs for symptomatic relief. Another patient, not an invalid, has the same difficulty, the chief underlying cause being arteriosclerosis. Any suggestions you may have will be appreciated. Please omit name.

M.D., Pennsylvania.

ANSWER.—It is questionable whether such severe nocturia can be caused alone by any of the conditions mentioned; namely, high blood pressure, nephritis, arteriosclerosis or bronchiectasis. Nocturia is often present with some types of nephritis and with vascular disease, but it seldom is the only cause of a distressing polyuria or of very frequent micturition.

It would seem probable that there is some cause other than those mentioned to account for the distressing nocturia described. It would be difficult to determine the etiologic factors without a careful examination of the entire genito-urinary tract. Such examination should first include a urinalysis. It is to be remembered that the absence of pus in the urine does not necessarily exclude infection, since bacteriuria may be the cause of frequent micturition. A gram stain of the sedimented urine should be made and carefully examined for bacteria, and cultures of the urine also should be made. The hydrogen ion concentration of the urine should be determined, since occasionally a hyperacid condition of the urine will cause irritation which can sometimes be relieved by the administration of sodium bicarbonate. The possibility of pressure on the bladder or

irritation by some extravesical condition should next be considered and excluded. A study of the prostate and its secretion is of importance to exclude the possibility of retention of urine or of prostatic infection. A cysto-urethroscopic examination may be necessary to exclude the possibility of a lesion in either the bladder or the urethra. It is taken for granted that a roentgenogram has been made of the urinary tract, to exclude the possibility of lithiasis, which may be accompanied by no other symptom than nocturia.

If such examinations prove to be negative, all fluids should be withheld from the diet of patients after 4 o'clock in the afternoon. This will necessarily be followed by a reduction in the amount of nocturnal renal excretion.

LOSS OF BASES IN ACIDOSIS

To the Editor:—1. It appears that in spite of the body's mechanism for combating acidosis by the buffers of the plasma and the auxiliary mechanism of renal oxidation and excretion of ketone bodies with increased ammonia formation, there is in diabetic ketosis an actual loss of base in the urine. I infer from the sources consulted that sodium and potassium are among the bases lost in addition to ammonia. Can you tell me in what form this sodium appears in the urine? Is it conjugated in some way with the ketone bodies or is it in the form of phosphates? Is there an accompanying loss of chlorine with this loss of sodium as in the dehydration accompanying cortical insufficiency? 2. Can you give me the references to the more significant observations on chloride retention in pneumonia and the changes in sodium and chloride balance that occur before and after the crisis? I know that some work has been done by Sunderman, and by Mackay and Butler in infections of the upper respiratory tract, but I cannot find the references. Please omit name.

M.D., Massachusetts.

ANSWER.—1. A certain amount of the ketone bodies can be disposed of by oxidation in the tissues, excretion as free acid, and excretion in combination with ammonia. When, in the course of diabetes, ketone acids in excess of this amount appear, the various fixed bases of the blood (chiefly sodium) are drawn on to neutralize the acids and are excreted with them. The chloride liberated by the removal of the basic radicals is largely excreted as ammonium chloride. Thus there are losses of both the basic and chloride ions as a direct consequence of the appearance of excessive amounts of the ketone acids. The marked diuresis and also the vomiting, which almost invariably accompanies diabetic acidosis, constitute other routes of salt loss. In these phenomena the ions may leave the body in their usual combinations.

2. Sunderman, F. W.: *J. Clin. Investigation* **9**: 615 (Feb.) 1931.
Fowler, A. F.: *Canad. M. A. J.* **32**: 482 (May) 1935.
Peters, J. P.: Body Waters, Baltimore, Charles C. Thomas, 1935.

HAY FEVER IN WASHINGTON AND CALIFORNIA

To the Editor:—Can you advise me concerning the hay fever situation due to ragweed throughout the states of Washington and California? Also advise me concerning the severeness of their winters. Is the climate such that a patient with neuritis could be advised to take up residence in either state?

W. E. DELICATE, M.D., Edwardsville, Ill.

ANSWER.—Atmospheric studies made at Seattle and Portland reveal the total absence of ragweed pollen from the air of these cities. This applies not only to the various ragweeds but to such related pollens as that of sagebrush. The results of the atmospheric studies are confirmed by local observation on the part of a number of investigators and are doubtless an index of conditions in the region west of the Cascade Range. Both ragweed and sagebrush are found in eastern Washington, but atmospheric contamination is much lower than in Illinois.

Average minimum winter temperatures for central eastern Washington are about the same as they are in the correspondent's city, whereas in western Washington the average minimum winter temperature is only 2 degrees below freezing. Thus it would seem that western Washington would be the more favorable part of the state unless the cool summers and more moist winters, compared with southern Illinois, would be undesirable on account of their possible effect on neuritis.

No part of California is entirely free from ragweed but, as in eastern Washington, atmospheric pollen contamination is low, at least in the places which have been studied; namely, Sacramento, San Francisco, Oakland, San Joaquin County, Los Angeles and Needles. Atmospheric pollen contamination throughout the state is much less than in the Central states, yet many Californians suffer with hay fever due to a variety of pollens. The usual experience of the Central states ragweed sufferers on removing to California is that they have complete freedom at least for two or three years.

One may find any sort of climate one wishes in a state with the varied topography of California. Minimum winter temperatures for the coastal area, the Sacramento Valley and the San Joaquin Valley are from 5 to 10 degrees higher than for Seattle and Portland, from 35 to 45 F. In these areas frost is rare. Normal January temperatures in southern California are at least 25 degrees higher than in the correspondent's locality. Thus, assuming that a dry warm climate such as that of southern California is most favorable for neuritis and knowing that western Washington is ideal for ragweed hay fever, the choice between these two sections would seem to depend on the relative severity of the two afflictions in this particular case.

DICHORIONIC OR DOUBLE OVUM TWINS

To the Editor:—Enclosed is a snapshot of a delivery I had on September 14. The larger fetus lived about thirty-five minutes and there was vigorous crying during most of that time. The snapshot was taken about five minutes after the fetus ceased respiration. The mother is a quintipara, all births having been normal. There were no unusual symptoms during this pregnancy, which was of six and a half months' duration, until the last month, when severe cramps began in the calves of the legs. These grew more severe and with them a numbness. Pains began suddenly, and delivery of the smaller fetus, which was very necrotic and of about three months' duration, occurred within two hours; the larger one was delivered in another hour. The placentas were expelled together, the smaller one being necrotic. Both specimens have been preserved. Would you please let me know how usual or unusual these cases are?

H. G. HARRIS, M.D., Wilmot, S. D.

ANSWER.—An occurrence similar to the one shown in the illustration is uncommon but by no means rare. Nearly always it occurs in the presence of dichorionic or double ovum twins. As in the present instance, one fetus dies early in pregnancy. For some unknown reason it is not expelled as usually occurs in the case in which death occurs in a single fetus in the uterus. The live twin continues to grow but the dead one undergoes degenerative and maceration changes and if it remains in the uterus long enough it becomes mummified. If the dead fetus is expelled a few weeks or months after its death, it appears as a macerated, shriveled up fetus and its placenta shows distinct evidence of degeneration. The dead fetus and the placenta are decidedly smaller than the fetus and placenta that continued to grow. The disparity in size between the two fetuses should not be interpreted as meaning that there were two conceptions with an interval of time between them. Had the larger baby continued to live to full term, a still more unusual sight would have presented itself; namely, a full term normal baby and placenta and in addition to this a tiny, dried up, flattened fetus known as a fetus papyraceus or fetus compressus.

Twins, one of whom died early in pregnancy

DIABETIC COMA—HYPERINSULINISM

To the Editor:—Is it possible for a patient known to have severe diabetes, who has been under large doses of insulin, to show signs of threatening coma (which responded to insulin treatment) with no acetone bodies in the urine and yet a four plus sugar and a very high blood sugar? Do signs of hyperinsulinism ever appear with blood sugars of 200 mg. in patients who are being treated for impending coma, they showing previously 350 mg? The treatment was rigid. Please omit name.

M.D., Rhode Island.

ANSWER.—The answers depend to some extent on what one considers to be the "signs of threatening coma" and the "signs of hyperinsulinism."

There is no definite level of hyperglycemia or glycosuria at which acetonuria appears in all cases, nor is there any constancy as to the amount of acetonuria present in all cases of diabetic coma. As a matter of fact, these relationships may show a fair degree of constancy in a given individual at different times, but they are known to vary widely in different individuals. Thus the appearance of acetonuria may be particularly tardy in elderly diabetic patients. It is therefore possible for a patient with severe diabetes, such as the one in question, who has been receiving large doses of insulin, to show a four plus glycosuria and a very high blood sugar without acetonuria at the time the earliest signs of coma appear. Pre-

sumably acetonuria would have appeared eventually, had the administration of additional insulin been further delayed. However, in evaluating the supposed "signs of threatening coma" it would be important to consider the direct effects of the infection or other influences which precipitated the loss in carbohydrate tolerance or "insulin resistance."

The "signs of hyperinsulinism" have been seen at a blood sugar level of 60 mg. per hundred cubic centimeters and not in instances in which the blood sugar fell below 20 mg. However, the appearance of typical hyperinsulinism at 200 mg. would be unusual to say the least. In elderly patients with diabetes and cardiovascular disease the rapid reduction of the blood sugar level, regardless of the absolute level at which this occurs, may result in stenocardial symptoms. This question is discussed by Soskin, Samuel; Katz, L. N.; Strouse, Solomon, and Rubinfeld, S. H.: Treatment of Elderly Diabetic Patients with Cardiovascular Disease, *Arch. Int. Med.* **51**:122 (Jan.) 1933.

HYPERSENSITIVITY TO TOBACCO

To the Editor:—A man, aged 28, complains of headache, some tearing of the eyes, a feeling of tightness or puffiness of the eyelids, stuffiness of the nose and a "catch" in the voice whenever he smells any cigaret or cigar smoke or if he tries to smoke a cigaret himself. He also complains of stuffiness of the nose when in a hot moist atmosphere. Physical examination is entirely negative. One sister has had asthmatic attacks in the fall, which have been controlled by ragweed injections. Is there any known method of desensitization to tobacco smoke? Please suggest treatment or give references to the literature. Please omit name.

M.D., New Jersey.

ANSWER.—The description of the case and the family history make it appear that this may be an instance of true (and perhaps atopic) hypersensitivity to tobacco. Sulzberger has shown that tobacco allergens (skin reaction-eliciting substances) are thermostable and coctostable and it is therefore highly probable that at least some of the allergens of the tobacco plant are also present in the smoke. There is no available experience on the results of desensitization to tobacco, but it might nevertheless be indicated to make the attempt in this case. The patient should first be skin tested by the application to a scratch of a saline extract prepared from the tobacco of his own cigarets. The extract should be prepared and the skin tests made in the manner usually employed in pollen disease. If there is no definite whealing or erythema at the scratch site, a minute amount (0.02 cc.) of the extract should be injected intracutaneously. (It is imperative to guard against shock with all the usual precautions; i. e., test on the forearm, have a tourniquet handy and be ready with a solution of epinephrine as well as with a syringe for subcutaneous injection.) If the patient reacts with a wheal to the skin tests, hyposensitization injections, just as employed in hay fever, may be tried. They would seem to have some promise of success, as with the symptoms described and with positive skin tests it does not appear far fetched to consider the case analogous to hay fever or asthma. Further information on recent work in tobacco hypersensitivity will be found in Harkavy, Joseph; Hebald, Selian, and Silbert, Samuel: *Proc. Soc. Exper. Biol. & Med.* **30**:104 (Oct.) 1932; Sulzberger, M. B.: *J. Immunol.* **24**:85 (Jan.) 1933; **24**:425 (May) 1933, and particularly in the summary and discussion of Sulzberger, M. B.: *Bull. New York Acad. Med.* **9**:294 (May) 1933.

EFFECTS OF SALT WATER IN MORNING

To the Editor:—Please advise me whether the habit of drinking a glass of salt water before breakfast is effective for chronic constipation and whether it could have a deleterious effect if used over a long period. Please omit my name and address.

M.D., Illinois.

ANSWER.—The drinking of two or three glasses of salty water before breakfast is sometimes a most satisfactory method of relieving constipation. We cannot see how it could possibly have a deleterious effect even if used throughout a lifetime. The principle appears to be that physiologic solution of sodium chloride at body temperature is not held back at the pylorus but runs right on down through the small bowel. Here again it appears to be neither absorbed nor diluted and hence it runs on into the colon, where it serves to bring about an evacuation.

Because the pylorus holds back cold liquids, the water should not be iced, and it must be taken before the pylorus is somewhat closed by the presence of food in the stomach. In order to make physiologic solution of sodium chloride about a third of a teaspoonful of table salt should be added to each glass of water. Three or four glasses should be drunk before breakfast while the morning toilet is being made.

ANTITULARENSE SERUM

To the Editor:—I have a patient who has had tularemia for three months. His temperature rises to as much as 102 F. in the afternoon, and he complains of joint and muscle soreness and pains. The joints of his hands are definitely stiff and sore. There seem to be no complications other than this. I should like to know whether this is very unusual and whether there has been anything discovered which would be of use in the way of treatment. The primary lesion, which resulted from a tick bite, has just about healed. Any information or suggestions would be appreciated.

WILKINS J. OZLIN, M.D., South Hill, Va.

ANSWER.—While the antitularense serum developed by Foshay appears to be most useful early in the course of the disease, there is considerable evidence to indicate that the duration of symptoms and the period of disability may be shortened by the administration of the antiserum even after the disease has remained active for three months (Foshay, Lee: An Antiserum for the Treatment of Tularemia, THE JOURNAL, Nov. 4, 1933, p. 1447; Tularemia Treated by a New Specific Antiserum, *Am. J. M. Sc.* **187**: 235 [Feb.] 1934; On the Treatment of Tularemia, *Ohio State Med. J.* **31**: 21-24 [Jan.] 1935). The antiserum, together with the directions for its administration, may be obtained directly from Dr. Lee Foshay, Cincinnati General Hospital, Cincinnati.

USE OF DIGITALIS

To the Editor:—Please discuss the use of digitalis in heart failure in an orthopedic man, aged 71, with heart beat below 60 and moderate edema. The only contraindication for its use is a heart beat (irregular) well below the patient's normal rate and when there is no digitalis in his system. Please read the answer to the question in THE JOURNAL, March 18, 1933, page 840, "Treatment of Disturbance of Circulation," in which digitalis is apparently not contraindicated by a heart rate of 30 to 35. Please omit name.

M.D., Minnesota.

ANSWER.—If, in a patient with obvious cardiac decomposition, the slowness of the pulse at the wrist is due to a "heart rate-pulse deficit" caused by auricular fibrillation, it is not only no contraindication to digitalis but the typical indication for digitalis therapy, and a liberal dosage of digitalis, should be given. It is assumed that in such a case the digitalis acts by producing heart block, setting the ventricle free from the dominance of the auricular contractions, and thus eliminates the weakest ventricular systoles, which do not reach the wrist, and strengthens the others, so that the pulse beat and ventricular beat tend to approximate each other. It is the absolute slowness of the heart beat due to heart block, as in Stokes-Adams disease, that is the typical contraindication to digitalis.

VENEREAL DISEASES

To the Editor:—I have heard the statement made that there are six venereal diseases. Is this so? I can account for only five: syphilis, gonorrhea, yaws, lymphogranuloma inguinale and soft chancre (Ducrey infection). Are Vincent's infection or any of the leishmaniases considered to be venereal? Any information you can give will be greatly appreciated.

EDWIN E. ZIEGLER, M.D., San Francisco.

ANSWER.—The designation of venereal diseases numerically is not desirable and the subject is one about which there is considerable controversy. The venereal diseases that are usually recognized in this country are five in number: syphilis, gonorrhea, chancroid, granuloma inguinale and lymphogranuloma inguinale. As a rule, those who speak of a sixth venereal disease consider a Vincent infection to be a venereal disease and lymphogranuloma inguinale to be the sixth disease. Clinically the Vincent infection and granuloma inguinale appear to be identical, but most workers now feel that this entity is due to the so-called Donovan's bodies and not to the Vincent organisms.

FOLLICULAR MANGE

To the Editor:—Would you kindly give me the following information: Is so-called follicular mange in dogs caused by a single parasitic mite, or are there a number of organisms responsible for the condition? Is this condition contagious to human beings; and if it is, how great are the chances of contagion? If human beings are susceptible to this parasitic infection, how serious may this infection become? What is the prognosis? What is the treatment? What is the prognosis in dogs when the condition is only slightly to moderately advanced, when no pustules are present, and when it is manifested only by some degree of loss of hair? What is the treatment for the dog? If this is published kindly omit my name.

M.D., Connecticut.

ANSWER.—Follicular mange in the dog is caused by a mite or acarid of the genus Demodex folliculorum. The dog acarid, like acarids in other animals, is practically not pathogenic for man or at best only rarely and mildly so. It seems that these parasites as a rule do not thrive on the human skin.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 29-July 1. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ALASKA: Juneau, March 2. Sec., Dr. W. W. Council, Juneau.

ARKANSAS: *(Regular).* Little Rock, Nov. 10. Sec., Dr. A. S. Buchanan, Prescott. *(Eclectic).* Little Rock, Nov. 10. Sec., Dr. Clarence H. Young, 207½ Main St., Little Rock.

CALIFORNIA: *Reciprocity.* Los Angeles, Dec. 16. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Regular.* Hartford, Nov. 10-11. *Endorsement.* Hartford, Nov. 24. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* Derby, Nov. 10. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 13-15. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, Dover.

DISTRICT OF COLUMBIA: Washington, Jan. 11-12. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, Nov. 16-17. Sec., Dr. William M. Rowlett, P. O. Box 786, Tampa.

IOWA: Des Moines, Dec. 1-3. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Topeka, Dec. 8-9. Sec., Board of Medical Registration and Examination, Dr. C. H. Ewing, 609 Broadway, Larned.

KENTUCKY: Louisville, Dec. 2-4. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

LOUISIANA: New Orleans, December. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MARYLAND: *Regular.* Baltimore, Dec. 8. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 8-9. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 17-19. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

NEBRASKA: Lincoln, Nov. 23-24. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEW HAMPSHIRE: Concord, March 11-12. Sec., Board of Registration in Medicine, Dr. Charles Duncan, State House, Concord.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 25-28. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: *Endorsement.* Raleigh, Nov. 30. Sec., Dr. Ben J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, Jan. 5-8. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OHIO: Columbus, Dec. 2-4. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Oklahoma City, Dec. 9. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science.* Portland, Nov. 21. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene. *Medical.* Portland, Jan. 5-7. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

PENNSYLVANIA: Philadelphia, January. Sec., Board of Medical Education and Licensure, Mr. James A. Newpher, Education Bldg., Harrisburg.

PUERTO RICO: San Juan, March 2. Sec., Dr. O. Costa Mandry, Box 536, San Juan.

SOUTH CAROLINA: Columbia, Nov. 10. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, Jan. 19-20. Dir., Division of Medical Licensure, Dr. B. A. Dyar, Pierre.

TEXAS: Waco, Nov. 10-12. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 10-12. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 9-13. Sec., Dr. J. W. Preston, 28½ Franklin Road, Roanoke.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 19. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical.* Madison, Jan. 12-14. Sec., Dr. Henry J. Gramling, 2203 S. Layton Blvd., Milwaukee.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* Feb. 9-11, June 21-23, and Sept. 13-15. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: Philadelphia, June. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written* examination will be held simultaneously in different centers of the United States and Canada in December. *Practical* or *clinical* examination will be given in St. Louis in April. Chairman, Dr. Walter L. Bierring, 406 Sixth Ave., Des Moines.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Cleveland, Jan. 9. *Only applications received by the Secretary on Dec. 1 or before will be acted upon by the Board.* Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Philadelphia, June 7-8. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: Baltimore, Nov. 17-18. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit, Mich.

AMERICAN BOARD OF PEDIATRICS: Baltimore, Nov. 15, and Cincinnati, Nov. 19. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 29-30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Atlantic City, June 4-6. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester.

AMERICAN BOARD OF UROLOGY: Chicago, Dec. 4-6. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Colorado July Report

Dr. Harvey W. Snyder, secretary, Colorado State Board of Medical Examiners, reports the written examination held in Denver, July 7, 1936. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. Sixty-one candidates were examined, 60 of whom passed and 1 failed. Ten physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine	(1936) 82, 82, 83, 84, 85, 86. 86, 86, 86.5, 87, 87, 87, 87, 87, 87, 88, 88, 88, 88, 88, 88, 88, 88, 88, 88, 88.5, 89, 89, 89, 89.5, 90, 90, 90, 90, 90, 91, 91, 92, 92.5	(1935)	82,
Northwestern University Medical School		(1936)	85
Harvard University Medical School		(1935)	86
St. Louis University School of Medicine		(1936)	81
Creighton University School of Medicine		(1935) 85, (1936)	87
University of Nebraska College of Medicine		(1935)	79
Cornell University Medical College		(1935)	85
University of Rochester School of Medicine		(1934)	84
University of Pennsylvania School of Medicine		(1935)	85
Marquette University School of Medicine		(1935)	83
Medizinische Fakultät der Universität Wien		(1932)*	80
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg		(1912)*	78
Osteopaths†			75, 78, 79, 81, 85, 85

	FAILED	Per Cent
Osteopath†		69

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Arkansas School of Medicine		(1935)	Arkansas
Loyola University School of Medicine		(1934)	Illinois
School of Medicine of the Division of the Biological Sciences		(1934)	N. B. M. Ex.
State University of Iowa College of Medicine		(1933)	Iowa
University of Kansas School of Medicine		(1935)	Kansas
Harvard University Medical School		(1933)	N. B. M. Ex.
Washington University School of Medicine		(1935)	Missouri
University of Nebraska College of Medicine		(1934), (1935)	Nebraska
New York University, University and Bellevue Hospital Medical College		(1928)	New York

*Verification of graduation in process.
† Examined in medicine and surgery.

Washington June-July Report

Mr. Dave S. Cohn, secretary, Department of Licenses, reports the written examination held in Seattle, June 29-July 1, 1936. The examination covered 7 subjects and included 70 questions. Thirty-eight candidates were examined, all of whom passed. Twenty-two physicians were licensed by reciprocity and 8 physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists	(1936) 83, 84, 87*		
Stanford University School of Medicine		(1936)	81
University of Colorado School of Medicine		(1935)	87
George Washington University School of Medicine		(1935)	73
Northwestern University Medical School	(1935) 78, 86, (1936) 80, 80, 83	(1934)	77,
Rush Medical College		(1933) 77, (1935)	84
University of Illinois College of Medicine	(1936) 88, 88	(1935)	89,
University of Kansas School of Medicine		(1935)	88
Harvard University Medical School		(1931) 83, (1932)	86, 89
University of Michigan Medical School		(1925) 79, (1934)	87
Creighton University School of Medicine		(1935)	84
University of Nebraska College of Medicine		(1935) 75,* 81,*	84
University of Rochester School of Medicine		(1932)	78
Ohio State University College of Medicine		(1929)	83*
University of Oregon Medical School	(1934) 80, (1935) 79, 82, 84	(1933)	87,
University of Wisconsin Medical School		(1935) 76,*	80
McGill University Faculty of Medicine		(1933) 83, (1935)	83*

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Stanford University School of Medicine		(1934, 2)	California
University of Colorado School of Medicine		(1933)	Colorado
Illinois Medical College, Chicago		(1903)	Montana
State University of Iowa College of Medicine		(1931), (1935)	Iowa
Louisiana State University Medical Center		(1936)	Louisiana
Tulane University of Louisiana School of Medicine		(1929)	Louisiana
Johns Hopkins University School of Medicine		(1904)	Tennessee
University of Minnesota Medical School		(1931)	Minnesota
St. Louis University School of Medicine		(1934)	Missouri
Creighton University School of Medicine		(1935, 2)	Nebraska
University of Nebraska College of Medicine		(1935)	Nebraska
Duke University School of Medicine		(1933)	Maryland
University of Oklahoma School of Medicine		(1935)	Oklahoma
University of Oregon Medical School	(1931), (1934), (1935) Oregon	(1932)	Wisconsin,
University of Pennsylvania School of Medicine		(1909)	Virginia
University of Virginia Department of Medicine		(1935)	Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1936, 6)	N. B. M. Ex.
University of Oregon Medical School		(1934, 2)	N. B. M. Ex.

* License has not been issued.

Book Notices

The Oxford Medicine. By Various Authors. Edited by Henry A. Christian, A.M., M.D., LL.D., Hersey Professor of the Theory and Practice of Physic, Harvard University. Volume VII: Psychiatry for Practitioners. Cloth. Price, $10. Pp. 634. New York: Oxford University Press, 1936.

This volume, with eleven contributors, is in loose leaf form. The subjects included are the recognition and the management of the beginning of mental disease, by Edward A. Strecker and Harold D. Palmer; the psychiatry of childhood, by Gerald Pearson; postencephalitic and posttraumatic behavior disorders, by Earl D. Bond; mental deficiency, by E. Arthur Whitney; the psychopathic personalities, by Eugen Kahn; the toxic reaction types, by Franklin G. Ebaugh; paranoia and paranoid conditions, by William A. White; the dementia praecox (schizophrenia) group, by Clarence O. Cheney; the affective reaction type (manic-depressive), including involutional melancholia, by D. K. Henderson, and psychoneuroses, by T. A. Ross. Each of these writers does well the task assigned to him. All are known for their contributions in this field, and those familiar with the field will know what to expect. The articles are written to appeal primarily to the general practitioner and the student rather than to the specialist. They are illustrated with interesting case reports presented in a succinct manner and for that reason appeal particularly to the general reader. Some of the essays, for example that on postencephalitic and posttraumatic behavior disorders, are hardly greater in scope than the contributions one finds readily in current periodicals. Others, however, such as the work of Ebaugh and that of Strecker, are monographic. The weakness of a book of this type is the multiple consideration which it brings of certain conditions, which, however, are taken up from varying points of view. A consultation of the index, which is none too complete, makes this multiple reference apparent. Each of the essays is accompanied by a well chosen bibliography.

Reports on Biological Standards. IV: The Standardization and Estimation of Vitamin A. Edited by E. Margaret Hume and Harriette Chick. Medical Research Council, Special Report Series, No. 202. Paper. Price, 1s. Pp. 61. London: His Majesty's Stationery Office, 1935.

The two most widely promoted vitamins are vitamin A and vitamin D. No satisfactory methods of physical or chemical assay have been devised for them. Animal assays of course are used and are satisfactory for most clinical practice; but they are costly, require a large expenditure of time, and their accuracy does not nearly approach that for ordinary analysis. Therefore attempts to standardize preparations by other than bio-assays are always welcome. In this direction the Medical Research Council of Great Britain has been fostering a series of reports on products now biologically standardized. The two hundred and second report of this council deals with the standardization and estimation of vitamin A.

After the introduction there is an excellent chapter dealing with carotene as the international standard of vitamin A. This alone is a complex subject in view of the fact that carotene exists in three isomeric forms—alpha, beta and gamma—and, besides that, there are a number of related substances. Notwithstanding, carotene has found a place in determining vitamin A activity. In the United States the Pharmacopeial Commission has deviated from this procedure in that it supplies reference standard cod liver oil for use in both vitamin A and vitamin D assays. At present analytical chemistry is undergoing a slow period of renaissance, during which time the examination of products in very small quantities is becoming greatly improved. This is due to the development of the microchemical balance with its remarkable sensitivity and developments which have grown from the use of this balance; also in large part to the spectrograph. It appears hopeful that vitamin A may soon be standardized in materials by the use of the spectrograph without the use of biologic assays even for a basis of primary standardization. The purpose of much of the work at the present time is to standardize a method of preparation of the samples. The physical measurement is already in wide use in determining the comparative vitamin A activity of lots of essentially the same material. It is also reported that the degree of concordance was fairly satisfactory when the results of spectrographic examination were compared with the biologic tests. Fortunately for this country and for many of the European countries, standards of an international character are now being used for the estimation of vitamin products. Therefore reports such as "The Standardization and Estimation of Vitamin A" issued by the Medical Research Council with comprehensive discussions of well conducted studies are much to be desired by those who are interested in the subject of accurate measurement and dosage of the vitamins.

A Handbook of Urology for Students and Practitioners. By Vernon Pennell, M.A., M.B., B.Chir., Hon. Surgeon, and Surgeon with charge of Urological Department, Addenbrooke's Hospital, Cambridge. Cloth. Price, $2.75. Pp. 224, with 34 illustrations. London: Cambridge University Press; New York: Macmillan Company, 1936.

The author presents this book as a handbook for the student and practitioner, and this end is admirably filled by a book having no pretense to being a complete treatise yet presenting its subject matter in concise and systematic style, giving a clear view of an essentially practical urology. The subject is treated in logical sequence with a convenient tabulation of essential and forceful headings. The few illustrations are well selected to give with the text a clear understanding of the subject. Rare diseases, obsolete treatment and controversial matter are omitted of necessity in a book of this size. The earlier chapters on investigation display the order of well organized practice and constitute a model on which the student might profitably base his examination of the urologic case. Thereafter the subject is presented on an anatomic basis with the exception of genito-urinary tuberculosis, which fittingly is considered as a whole in a single and separate chapter. The peculiar problems arising in the nursing of the urologic patient are considered and a useful appendix tabulating drugs, urinary antiseptics, and so on, closes the book. The author makes apology for possible dogmatism, yet his presentation is in accord with the most widely accepted of modern teaching, so that his text only gains in clarity. This book is as remarkable for the wealth of information presented as for its readability. Mr. Pennell has given to urologic literature what Bailey and Love have given to surgery, concise exposition of essentials in practice. Having regard to the limitations of so small a volume, the urologic student must find this book an excellent supplement to the larger works. Though unsatisfying perhaps to the specialist, the work will be welcomed by the student and the intern.

Tendances de la médecine contemporaine: La médecine à la croisée des chemins. Par P. Delore, médecin des hôpitaux de Lyon. Paper. Price, 27 francs. Pp. 218. Paris: Masson & Cie, 1936.

This book is devoted to a philosophic and critical discussion in general terms of tendencies in medicine, current and developing. As indicated by the title, medicine is believed to be at the crossroads, a phrase first used by Cushing. In spite of its great achievements, contemporary medicine now suffers, according to Delore, from certain unfavorable tendencies such as lack of genuine clinical spirit, early and excessive specialization, undue reliance on laboratory tests, failure to consider the patient in relation to his surroundings, and the useless overproduction of medical publications. In the further evolution of medicine, however, the author recognizes certain favorable trends; e. g., increased emphasis on physiology and psychology, on constitution and heredity, on the relation of disease to social environment, on a more broad and synthetic conception of disease, on efforts to detect disease in its earliest and preclinical stages, and on the prevention of disease. The style is clear and lively.

The Eye and Its Diseases. By 82 International Authorities. Edited by Conrad Berens, M.D., Ophthalmic Surgeon, Pathologist and Director of Research, New York Eye and Ear Infirmary. Cloth. Price, $12. Pp. 1,254, with 436 illustrations. Philadelphia & London: W. B. Saunders Company, 1936.

In this volume competent ophthalmologists throughout the world cooperate to present a complete textbook. Eighty-two authorities are included. The book follows the classic procedure in medicine of beginning with history and proceeding to anatomy and physiology, examination, refraction, disease, medical ophthalmology, injuries, treatment and prophylaxis. There are also chapters on the legal aspects of ophthalmology, immunology and laboratory diagnosis. The historical introduction by Shastid is essentially a series of brief biographies of noted discoverers. The sections on anatomy and physiology are excellently illustrated and the section on routine examination is practical. It becomes apparent through this section how

greatly the knowledge of ophthalmology has benefited from the discovery of new types of apparatus. The book is quite up to date and, while concise, at the same time sufficiently complete to be in miniature an encyclopedia of ophthalmology. Especially to be commended are the numerous excellently reproduced illustrations and the extraordinarily complete index. It is interesting to observe that trachoma is still a disease of doubtful etiology, with the author inclined to the belief that trachoma began as an infection of the genital tract transferred to the eye and modified by many generations of passage. The student has now available several textbooks of ophthalmology under a single authorship and the present symposium type of volume. There are certain factors of advantage and disadvantage associated with each type. Certainly, however, the Berens book does much to minimize the disadvantages of the symposium type and to develop by its single editorship many of the advantages of the volume produced by a single author.

Einführung in die Physiologie des Menschen. Von Professor Dr. Hermann Rein. Direktor des Physiologischen Instituts der Universität Göttingen. Paper. Price, 18 marks. Pp. 464, with 366 illustrations. Berlin: Julius Springer, 1936.

As a distinguished student of Max von Frey, Professor Rein was asked to reedit the former's textbook in physiology. In his foreword Rein points out that von Frey's book was such a product of his personality that it would be impossible for one to do justice to a revision. He therefore chose to prepare a new book. In so doing he has put together a great deal of the new matter in the physiologic literature, alongside of much that is classic, in such a way as to provide a useful source of material for the serious student of physiology. There is a liberal amount of factual material in the book, so that the student is provided with a great deal of meat to work with. The physical rather than the chemical aspects of physiology have been stressed. Particularly in relation to muscle physiology this appears to constitute a defect. The traditional treatment of muscle physiology from the mechanical point of view deprives the subject of its importance and significance. In connection with the physiology of the kidney, the chemistry is largely of a qualitative sort, and there is no adequate discussion of such important problems as renal clearance. In general the chemical features of the book are all elementary and remain, for the most part, at the descriptive stage. A conspicuous exception is in the chemistry of the blood, which is amply discussed. The discussion of the vitamins is quite inadequate for a modern textbook. However, the excellent treatment of the physical side of physiology warrants high praise and makes the book valuable to a certain group of readers.

The Gift of Columbus. By Charles C. Dennie, M.D. Cloth. Price, $2. Pp. 195. Kansas City, Missouri: Brown-White Company, 1936.

When syphilis appeared in Spain during the latter part of the fifteenth century, many Spanish physicians commented on its ravages. Among the most interesting of the writings were those of Francisco Lopez de Villalobos, whose contributions stimulated Dr. Dennie's volume. The book begins with a discussion of the origin and history of syphilis and a brief sketch of the life of Villalobos and of the evidence for and against the American origin of syphilis. There follows a consideration of the various manifestations of the disease, all presented in popular form, with a concluding chapter entitled "Syphilis Can Be Conquered," explaining the modern methods of treatment. The final chapter preaches the value of prophylaxis. While the volume cannot be considered a significant contribution in the debate as to the origin of syphilis, it should be read with interest by all who are anxious to inform themselves concerning the nature of the disease.

Kurze Übersichtstabelle zur Geschichte der Medizin. Von L. Aschoff und P. Diepgen. Third edition. Paper. Price, 4.80 marks. Pp. 61. Munich: J. F. Bergmann, 1936.

This is the third revised and enlarged edition of the famous Aschoff tables of the history of medicine. They make available in brief form the dates and the records of medical discovery. It is interesting to observe that the leading contributions of the current decades are considered by the author to be the development of insulin, the Aschheim-Zondek test, the antiallergic rooms, new anesthetics such as ethylene, acetylene and tribrom-ethanol, the use of activated ergosterol for rickets, and the new operations on the sympathetic nervous system. To these the author would add some new political effects on medicine, including the point of view of the Nazi government in Germany.

Heart Disease and Tuberculosis: Efforts Including Methods of Diaphragmatic and Costal Respiration to Lessen Their Prevalence. By S. Adolphus Knopf, M.D. Cloth. Price, $1.25. Pp. 108, with 56 illustrations. Livingston, Columbia County, New York: Livingston Press, 1936.

There is nothing in this booklet to recommend it unless it is the illustrated breathing exercises to increase the girth of the chest. It is rambling and unscientific, with recourse to selected quotations from "authorities." It is an example of the type of writing which, fortunately, is getting rare in medicine.

American Martyrs to Science Through the Roentgen Rays. With a Short Glossary of the Scientific Terms Used in the Text. By Percy Brown, M.D., F.A.C.P., F.A.C.R., Historian, American Roentgen Ray Society. Cloth. Price, $3.50. Pp. 276, with 55 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1936.

When the roentgen rays were first contributed to medical science, early workers failed to realize their menace to the unprotected worker; hence the passing of the years has seen the mutilation and death of many of those who conducted the earliest experiments. They were all martyrs to the advancement of medical science. Dr. Percy Brown gives brief biographies of twenty-eight of these martyrs, indicating as well their scientific contributions to the field they helped to advance. Today there are still among us many roentgenologists who will also in the coming years die as a result of their efforts in this field. Some day, no doubt, medical literature will make available a long list of these physicians who throughout the world have given their careers and their lives to the advancement of roentgenology. Even this brief collection is an inspiration.

Röntgendiagnostik der Knochen- und Gelenkkrankheiten. Heft 4 (Abteilung Gelenkkrankheiten): Degenerative Wirbelsäulenerkrankungen. Von Professor Dr. Robert Kienböck. Paper. Price, 24 marks. Pp. 229-450, with 215 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1936.

This paper covered monograph is one of the most creditable pieces of work that has come from any radiologist. The author discusses degenerative diseases of the vertebrae, adolescent kyphosis or Scheuermann's lesion, vertebral epiphysitis, spondylitis, lumbosacral disease and its relation to sciatica and arthritis deformans, and hemangioma of the vertebrae. The reproductions of the roentgenograms are excellent.

Disability Evaluation: Principles of Treatment of Compensable Injuries. By Earl D. McBride, B.S., M.D., F.A.C.S., Assistant Professor in Orthopedic Surgery, University of Oklahoma School of Medicine. Cloth. Price, $8. Pp. 623, with 374 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1936.

The author presents a book that should be of great value to every one interested in industrial lesions, since it appraises the extent of functional loss from the economic standpoint. The writer has formulated a uniform system of arriving at percentage of disability. He discusses the workman's compensation laws, standardizing disability, examination of the disabled and ankylosis of every joint, disabilities resulting from fractures throughout the body, nerve injuries, head injuries and injuries of the eye and ear, burns and hernia. The line drawings are easily understood and instructive.

Medicine in the Bible: The Pentateuch, Torah. By Charles J. Brim, M.D., Department of Medicine, Beth Israel Hospital, New York. With an introduction by Victor Robinson, M.D., Professor of History of Medicine, Temple University School of Medicine, Philadelphia. Cloth. Price, $5. Pp. 384, with 18 illustrations. New York: Froben Press, 1936.

This volume is more correctly a reflection of the medical references in the Old Testament. The author has carefully culled these references and has added to them definitions, excellent notes and Talmudic references. His work appears to be authentic and contains much of interest, not only for the scholar but for the general reader. There are a few attractive illustrations and a useful index.

The Hygiene of the Change in Women (The Climacteric). By Isabel Emslie Hutton, M.D. Cloth. Price, 5s. Pp. 110. London: William Heinemann, Ltd., 1936.

This is a sound book of advice for women at the climacteric. It discusses not only the usual symptoms and hygiene of this period but also the diet in relationship to weight, and particularly the art of living. A useful chapter is one of advice to husbands.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Accident Insurance: Excessive Application of Heat by Patient as "Medical Treatment."—The defendant insurance company issued a policy to the plaintiff providing stated benefits for "loss resulting directly and independently of all other causes from bodily injuries effected . . . solely from accidental means." Benefits, however, were not to be paid for loss "caused directly or indirectly, wholly or partly, by . . . bacterial infections (except pyogenic infections which occur simultaneously with and through an accidental cut or wound) or . . . by medical or surgical treatment, except such as may result directly from surgical operations made necessary solely by injuries covered by this policy."

A chiropodist in undertaking to remove a callus from the insured's foot pared and cut it too deeply. The callus became infected, an ulcer formed and the insured went to a physician, who lanced it. In accordance with the physician's directions the patient applied heat to the infected place, using, apparently without the physician's knowledge, a device made by a local electrician. The foot was badly burned and it was necessary subsequently to amputate the leg. He brought suit on the policy and from a judgment in favor of the insurance company, rendered by the district court of the United States for the eastern district of Louisiana, he appealed to the circuit court of appeals, fifth circuit.

"Medical and surgical treatment," said the circuit court of appeals, mean what is done by a physician of any recognized type in diagnosing a bodily ailment and seeking to alleviate or cure it, including the things done by the patient to carry out the specific directions of the physician. We may assume without deciding that a chiropodist's treatment is not medical or surgical treatment within the meaning of the policy and that the chiropodist in paring and cutting the callus too deeply performed some unintended act or slip rather than an expected consequence of an intentional act consented to by the plaintiff. Thus assuming, there would be an accidental wound, the pyogenic infection following which is not excluded from the coverage of the policy. But this wound did not result "directly and independently of all other causes" in the amputation which was subsequently necessary. Its direct result was to send the plaintiff to his physician to seek medical treatment. The treatment consisted first in lancing the ulcer, hardly to be called a surgical operation. Then the physician prescribed as further treatment the use of heat on the foot. It is not alleged that any accident occurred in the use of the heat. The electrical apparatus used for that end was deliberately chosen by the insured. The burn was occasioned by no sudden or extraordinary occurrence and was not the result of any accidental means, but of the means deliberately used. If an accident at all, it was an accident caused directly or indirectly by medical treatment prescribed by the physician. The burn was not the direct or natural consequence either of the ulcer or of the lancing of it, but of the use of heat as a curative agent. Since the policy did not insure against an accident or an injury which is the direct or indirect result of medical treatment, the court held that the insured had no valid claim under the policy and affirmed the judgment in favor of the insurer.—*Barkerding v. Aetna Life Ins. Co., 82 F. (2d) 358.*

Accident Insurance: Peritonitis as an "Infection."—Gregory fell from a locomotive, suffering an injury to his stomach. Peritonitis developed and nineteen days later he died. His widow brought suit on an insurance policy which provided stated benefits if the insured should "through external, violent and accidental means, receive bodily injuries which shall, independently of all other causes, result within six months . . . in . . . death . . . ." Benefits, however, were not to be paid if death resulted from "any poison or infection unless the infection is introduced into or by and through an open wound . . . visible to the naked eye." From a judgment in favor of the beneficiary, entered on a finding of the jury that Gregory's death was the result of the injury stated, independently of all other causes, the insurer appealed to the court of civil appeals of Texas, Eastland.

The insurer contended that it was not liable because the evidence showed conclusively that Gregory's death was caused by infection and that that infection was not introduced into his body through any open wound visible to the naked eye. While much of the evidence, said the court of civil appeals, is in dispute, we deem it sufficient to authorize the conclusion that about nineteen days before Gregory's death he fell from a locomotive engine and suffered an injury to his stomach which caused his death. Apparently his injury did not produce any open wound visible to the eye but, according to medical evidence adduced by the beneficiary, the sole and only cause of his death was the blow received on his abdomen, which was sufficient to bruise the tissues and cause peritonitis. The policy, continued the court, provided for compensation for external accidental injuries which, independently of all other causes, result within six months in death. It is difficult to imagine a death six months after such an injury in which infection or disease had not set up as a result of the injury and finally produced death. The provision of the policy that exempted the insurer from liability from a death resulting from infection unless that infection is introduced through an open wound, in the court's opinion, was not intended to provide only for compensation for death resulting immediately from a violent external injury (before disease or infection had time to develop) nor was it meant to exclude death resulting within the period from disease or infection produced solely by such injury. To support such a conclusion the court relied on the familiar rule of law that the ordinary meaning of words and terms as they are commonly understood by the average layman is to be adopted in preference to a technical meaning as understood by members of a profession or by a lexicographer. The ordinary conception of the word "infection," the court concluded, to a layman implies the invasion of bacteria from the air into an opening or abrasion on the surface of the skin or body, causing "toxic or blood poisoning." That being so, this exemption was not intended to operate or apply to the facts in the present case where infection or disease is caused to operate internally as the result of an external injury, even though it may be conceded that peritonitis in its technical or medical sense may be an infection.

In any event, the court concluded, the insurer was liable for the benefits because Gregory's death was the result of the accident and was not the result of the infection, the infection being merely a link in the chain of causation, a result of the injury and the medium through which the injury acted in producing death. Without injury to Gregory's stomach caused by his fall, there would have been no peritonitis and no death.

The judgment in favor of the beneficiary was accordingly affirmed.—*Order of Railway Conductors of America v. Gregory (Texas), 91 S. W. (2d) 1139.*

Society Proceedings

COMING MEETINGS

American Society of Tropical Medicine, Baltimore, November 18-20. Dr. N. Paul Hudson, Department of Bacteriology, Ohio State University, Columbus, Ohio, Secretary.

National Society for the Prevention of Blindness, Columbus, Ohio, Dec. 3-5. Mr. Lewis H. Carris, 50 West 50th St., New York, Managing Director.

Pacific Coast Society of Obstetrics and Gynecology, Seattle, Nov. 11-14. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.

Radiological Society of North America, Cincinnati, Nov. 30-Dec. 4. Dr. Donald S. Childs, 607 Medical Arts Building, Syracuse, N. Y., Secretary.

Society for the Study of Asthma and Allied Conditions, New York, Dec. 5. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.

Society of American Bacteriologists, Indianapolis, Dec. 28-30. Dr. I. L. Baldwin, College of Agriculture, University of Wisconsin, Madison, Wis., Secretary.

Southern Medical Association, Baltimore, November 17-20. Mr. C. P. Loranz, Empire Building, Birmingham, Ala., Secretary.

Southern Surgical Association, Edgewater Park, Miss., Dec. 15-17. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.

Southwestern Medical Association, El Paso, Texas, Nov. 19-21. Dr. Orville E. Egbert, 116 Mills Street, El Paso, Secretary.

Texas Ophthalmological and Oto-Laryngological Society, Fort Worth, Dec. 4-5. Dr. Kelly Cox, 1719 Pacific Ave., Dallas, Secretary.

Western Surgical Association, Kansas City, Mo., Dec. 11-12. Dr. A. H. Montgomery, 122 S. Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

192: 301-444 (Sept.) 1936

Chronic Hemolytic Anemia with Paroxysmal Nocturnal Hemoglobinuria. L. P. Hamburger and A. Bernstein, Baltimore.—p. 301.

*Comparative Study of Cytoplasmic and Nuclear Changes in Neutrophils in Severe Infectious States. T. H. Mendell, D. R. Meranze and T. Meranze, Philadelphia.—p. 316.

Chronic Constrictive Pericarditis, Electrocardiographic and Clinical Studies. E. H. Cushing and H. S. Feil, Cleveland.—p. 327.

Complete Auriculoventricular Dissociation: Clinical Study of Seventy-Two Cases, with Note on Curious Form of Auricular Arrhythmia Frequently Observed. A. Graybiel and P. D. White, Boston.—p. 334.

Observations on Some of Physiologic Effects of Correction of Faulty Posture. L. B. Laplace and J. T. Nicholson, Philadelphia.—p. 345.

*Intra-Abdominal Torsion of Appendices Epiploicae: Report of Two Cases and Review of Literature. F. A. Fiske, Philadelphia.—p. 354.

Cerebral Lesions in Uncomplicated Fatal Diabetic Acidosis. E. S. Dillon, H. E. Riggs and W. W. Dyer, Philadelphia.—p. 360.

Carotenemia and Diabetes Mellitus with Necropsy Report and Analyses of Liver for Carotene, Vitamin A, Total Fat and Cholesterol: Case. A. C. Pariente, Clara H. Present and Elaine P. Ralli, New York.—p. 365.

Arteriosclerosis in Young Diabetics: Method for Its Recognition by Arterial Elasticity Measurements. P. Hallock, Minneapolis.—p. 371.

Metabolism of Levulose: VIII. Influence on Tolerance of Certain Nonendocrine Disorders. A. W. Rowe, Mary A. McManus, Gertrude A. Riley and A. J. Plummer, Boston.—p. 377.

*Urticaria from Cold Sensitivity and of Effect of Histamine Treatment: Studies on Two Cases. L. L. Saylor and I. S. Wright, New York.—p. 388.

Essential Hypertension: II. Constitutional Considerations. M. Backer, Bridgeport, Conn.—p. 395.

Changes in Neutrophils in Severe Infectious States.—Mendell and the Meranzes studied sixty cases of severe infections (septicemia, bacteremia, pneumonia, peritonitis, osteomyelitis and severe mastoiditis), diseases which they have found to be associated with both nuclear and cytoplasmic changes. Since it is generally appreciated that single hemograms are of but limited interpretative value, they made frequent examinations (total white counts, differentials, Schilling and degenerative indexes) during the course of each illness, with repeated comparisons with the clinical state. From these studies they attempted to determine the value of each procedure independently and any advantage that one procedure might have over the other. From these investigations and their experience, they have looked on nonfilament counts of from 8 to 16 as normal, from 17 to 30 as a moderate shift to the left indicative of advancing infection, from 31 to 40 as a marked shift to the left and seen in severe infections, and 41 or more as an extreme shift to the left seen in grave states. In twenty of the sixty cases studied, both the degenerative index and the Schilling index proved to be of equal value. Of the remaining forty cases, in thirty-six the degenerative index was superior to the Schilling index. In only four of these forty cases was the Schilling index superior to the degenerative index. This series showed that at the height of the illness the degenerative index more accurately reflected the existing clinical state and the subsequent course. Degenerative cytoplasmic changes appeared earlier and persisted longer than did the corresponding nuclear changes during the critical stages of the illnesses studied. It is important to note how valuable both tests proved to be, and that, though the degenerative index proved to be superior in the majority of cases, the Schilling index again showed itself to be a very valuable procedure. It is evident that no hemogram in severe infection is complete without determination of the degenerative index.

Intra-Abdominal Torsion of Appendices Epiploicae.—To the forty-two cases of intra-abdominal torsion or infarction of the appendices epiploicae reported in the literature, Fiske adds two. A correct preoperative diagnosis was not made in any of the cases reviewed. The diagnosis of appendicitis in some form was the most frequent error. Among the preoperative diagnoses made were torsion of ovarian cyst, diverticulitis, tumor of the sigmoid, tubo-ovarian disease, cholelithiasis, degenerated myomas, intestinal obstruction and paralysis and peritonitis. Intra-abdominal torsion and hemorrhagic infarction of the appendices epiploicae are definite clinical entities. The most characteristic clinical symptom was abdominal pain, usually occurring over the site of the lesion. There may be associated localized tenderness. Nausea and vomiting were uncommon. A palpable tumor was present in seven cases. Intra-abdominal disease of the appendices epiploicae resulted in complications causing death in three cases. Preoperative diagnosis is difficult. In any obscure case of abdominal pain that is not explained by operative observation, an exploration of the appendices epiploicae should be considered.

Studies on Urticaria from Cold Sensitivity and Effect of Histamine Treatment.—Saylor and Wright discuss two cases of cold sensitivity, in one of which there was an unusually high temperature at which the reaction occurs. The blood pressure, pulse, skin temperature and gastric acidity responses of the patient to the cold urticaria are very similar to those resulting when histamine is administered. Therefore they deduce, in agreement with other authors, that these phenomena are due to an H, histamine-like, substance liberated from the tissue cells when they are exposed to certain degrees of cold. This substance is then taken up by the blood from the edematous wheal thus formed, which results in the production of the physiologic responses that simulate those of histamine. Since the temperature of the skin of their patient at which the reaction occurred was 80.2 F., the threshold was raised 60.2 F., an increase as compared with Bray's patient. There was no evidence of allergy in the skin tests, in eosinophil counts, in the passive transfer of serum test (Prausnitz-Küstner reaction) or in a family and personal history. It is not clear, at present, why histamine relieved the patient. The other patient first developed symptoms and became unconscious when swimming in cold water. This patient would probably have drowned had she not been rescued. It would seem, therefore, that wider dissemination of information regarding this syndrome should be undertaken. There are undoubtedly many unrecognized cases of this condition, and the dangers to these individuals of swimming, tub-bathing or taking showers in cold water cannot be overemphasized. It is entirely possible that the reaction might be of such severity as to produce a depression of blood pressure that would be incompatible with life.

American Journal of Physiology, Baltimore

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Rôle of Thyroid in Calorigenic Action of Vitamin D. H. Deutsch, C. I. Reed and H. C. Struck, Chicago.—p. 1.

Effect of Experimental Hyperthyroidism on Carbohydrate Metabolism. I. A. Mirsky and R. H. Broh-Kahn, Cincinnati.—p. 6.

Study of Blood Sugar of Adrenalectomized Dog. W. M. Parkins, H. W. Hays and W. W. Swingle, Princeton, N. J.—p. 13.

Study of Average Temperature of Tissues, of Exchanges of Heat and Vasomotor Responses in Man by Means of Bath Calorimeter. A. C. Burton and H. C. Bazett, Philadelphia.—p. 36.

Augmentation of Gonad Stimulating Action of Pituitary Extracts by Inorganic Substances, Particularly Copper Salts. H. L. Fevold, F. L. Hisaw and R. Greep, Boston.—p. 68.

Rôle of Duodenal Secretions in Prevention of Experimental Jejunal Ulcer. C. M. Wilhelmj, F. T. O'Brien, H. H. McCarthy and F. C. Hill, Omaha.—p. 79.

Endometrial Vascular Bed in Relation to Rhythmic Uterine Motility, with Consideration of Functions of Intermittent Contractions of Estrus. J. Fagin and S. R. M. Reynolds, Brooklyn.—p. 86.

Effect of Certain Sulfur Compounds on Coagulation of Blood. J. H. Sterner and Grace Medes, Philadelphia.—p. 92.

In Vitro Action of Crystalline Vitamin B_1 on Pyruvic Acid Metabolism in Tissues from Polyneuritic Chicks. W. C. Sherman and C. A. Elvehjem, Madison, Wis.—p. 142.

Relation of Pancreatic Juice to Pancreatic Diabetes. H. P. Harms, J. Van Prohaska and L. R. Dragstedt, Chicago.—p. 160.

Relation of Pancreatic Juice to Fatty Infiltration and Degeneration of Liver in Depancreatized Dog. J. Van Prohaska, L. R. Dragstedt and H. P. Harms, Chicago.—p. 166.

Observations on Substance in Pancreas (Fat Metabolizing Hormone) Which Permits Survival and Prevents Liver Changes in Depancreatized Dogs. L. R. Dragstedt, J. Van Prohaska and H. P. Harms, Chicago.—p. 175.

Histone Combinations of Protein Hormones. F. Bischoff, Santa Barbara, Calif.—p. 182.

Archives of Neurology and Psychiatry, Chicago

36: 449-674 (Sept.) 1936

*Epilepsy and Surgical Therapy. W. Penfield, Montreal.—p. 449.
Paraphysial Cysts. A. J. McLean, Portland, Ore.—p. 485.
Multiple Telangiectases of the Brain: Discussion of Hereditary Factors in Their Development. J. C. Michael, Minneapolis, and P. M. Levin, Baltimore.—p. 514.
Pyramidal Tracts: Experimental Study of Corticospinal and Other Components in Rabbit. R. L. Swank, Chicago.—p. 530.
Glioblastoma: Point of View Concerning Treatment. K. G. McKenzie, Toronto.—p. 542.
Primary Degeneration of Corpus Callosum (Marchiafava's Disease). L. S. King and Marjorie C. Meehan, Boston.—p. 547.
Vascular Changes in Lateral Geniculate Body Following Extirpation of Visual Cortex. Y.-C. Tsang, Chicago.—p. 569.
Cerebral Frontal Agenesis in Association with Epilepsy. J. F. Bateman, Cincinnati.—p. 578.
*Oscillopsia: New Symptom Commonly Occurring in Multiple Sclerosis. R. M. Brickner, New York.—p. 586.
Calcium Content of Blood Serum During an Epileptic Convulsion. M. Scott and A. W. Pigott, Skillman, N. J.—p. 590.

Surgical Therapy in Epilepsy.—Penfield declares that surgical therapy in epilepsy demands the most exhaustive preliminary study of the anatomy involved. No surgical procedure should be countenanced unless it is directed by rational analysis of the individual etiologic problem. Cervicothoracic sympathetic ganglionectomy has failed, except perhaps in the occasional case in which the condition is associated with obvious abnormality of the sympathetic nervous system. Removal of the carotid body and denervation of the carotid sinus are as yet without theoretical justification except in the rare case of demonstrably abnormal carotid sinus reflex. Nevertheless, the practical results secured by Lauwers demand further consideration. Subtemporal decompression should be carried out only occasionally as an incident to craniotomy undertaken for other purposes or in the rare instances of chronic collection of fluid in the subdural space, in which case the procedure may result in cure. Spinal insufflation of air or oxygen has been found effective only for patients less than 16 years of age whose seizures have occurred for four years or less. Epileptiform seizures secondary to lesions of the brain (tumor or cicatrix in the adult) call for surgical therapy. Operative excision of such cicatrices and of areas of focal atrophy gives an even better result from the point of view of cessation of attacks than does radical extirpation of the more benign types of tumor. After radical excision of meningocerebral cicatrix (twenty-two cases) 46 per cent of the patients have remained attack free and 32 per cent are markedly improved. After radical excision of areas of focal atrophy and focal cerebral cicatrix (twenty-two cases) 41 per cent of the patients are attack free and 32 per cent are improved. For epileptiform seizures, exclusive of those with which neoplasm, abscess or hemorrhage of the brain were associated, there have been in all seventy-five major craniotomies during a period of six years, with two operative deaths. In spite of the fact that these seventy-five operations include the negative explorations, 32 per cent of the total number of patients are free from attacks and 23 per cent are definitely improved. For discriminating radical operation, a wide osteoplastic exposure should be made so that the exploration may be ample. To open a subarachnoid collection of fluid is to do nothing of therapeutic value. When removal is undertaken, the line of excision should be made through normal surrounding brain no matter what type the cicatrix may be. The removal must leave no damaged tissue behind and, when easily possible, should enter the ventricle. Such an excision leaves a fluid-filled space, with little or no scarring. This excision should be preceded by painstaking electrical exploration of the cortex under local anesthesia and should be carried out only when the evidence indicates that the location of the area in question corresponds with the pattern of convulsive seizure from which the patient suffers. Spontaneous arrest of habitual seizures is not an unknown phenomenon in essential epilepsy but never occurs when there is a definite objective lesion of the brain. Epilepsy can never be certified as cured. Former sufferers must always be considered potentially epileptic, and an illness with high fever may bring on a seizure in such a person years after the apparent cessation of the malady. Therefore the "cures" listed cannot be considered final, but the result is none the less gratifying to the patient.

New Symptom in Multiple Sclerosis.—Brickner discusses an apparently heretofore undescribed symptom that was observed in a recent study of sixty-two cases of multiple sclerosis. The name oscillopsia (oscillating vision) is suggested for it. The patient complains that objects seem to move back and forth, to jerk or to wiggle. The oscillation usually occurs only during walking, although occasionally it also manifests itself during fixation of gaze at rest. Most commonly it applies to near and distant objects equally. The motion may be in any direction, although the lateral component is usually the most prominent. The oscillation under consideration is an oscillatory sensation associated specifically with certain phenomena of walking and fixation of gaze. Nystagmus is the most common mechanism; intention tremor of the head is rather frequent, and occasionally oscillopsia depends on tremors. Sometimes two or more factors are combined. In no instance has the symptom been observed unless at least one of these phenomena was present. The symptom occurred in eight of the sixty-two cases (12.9 per cent) and as diplopia without actual oscillopsia in another. Data relevant to the matter were lacking in some of the earlier cases, in which the symptom was not sought; so the incidence may have been even higher. The symptom has been seen five times in another group of patients (one of whom did not present typical multiple sclerosis). In eight of the thirteen cases in which the symptom has been seen, it developed within the first two years. In one (in which it was associated only with tremors) it was a first symptom.

Archives of Surgery, Chicago

33: 349-544 (Sept.) 1936

Congenital Defects of Femur, Fibula and Tibia. E. Freund, Venice, Fla.—p. 349.
*Arrhenoblastoma of Ovary: Testicular Adenoma Tubulare. M. Behrend and S. Levine, Philadelphia.—p. 392.
Chronic Occlusion of Portal Vein. J. P. Simonds, Chicago.—p. 397.
*Fibrosarcoma of Soft Parts, with Especial Reference to Recurrence and Metastasis. S. Warren and G. N. J. Sommer Jr., Boston.—p. 425.
Effect of Fat Introduced into Jejunum by Fistula on Motility and Emptying Time of Stomach. J. M. Waugh, Rochester, Minn.—p. 451.
Sarcoma of Stomach. F. Glenn and E. Douglas, New York.—p. 467.
*New Test for Evaluating Circulation in Venous System of the Lower Extremity Affected by Varicosities. H. R. Mahorner and A. Ochsner, New Orleans.—p. 479.
The Problem of Wound Healing: I. Effect of Local Agents. L. S. Smelo, Philadelphia.—p. 493.
Estrus Cycles in Mice of Cancerous and Noncancerous Strains. A. Brunschwig and A. D. Bissell, Chicago.—p. 515.
Review of Urologic Surgery. A. J. Scholl, Los Angeles; F. Hinman, San Francisco; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson and J. T. Priestley, Rochester, Minn.; J. Verbrugge, Antwerp, Belgium, and V. J. O'Conor, Chicago.—p. 521.

Arrhenoblastoma of Ovary.—Behrend and Levine present a case of testicular adenoma tubulare of the ovary. Masculine features were lacking; vaginal atresia, lack of a cervix, a rudimentary uterus and amenorrhea were present. The case emphasizes that external feminine characteristics are not incompatible with a gonad containing testicular structures. As is well known, the other endocrine glands, such as the adrenal cortex, the pituitary body and the pineal gland, play an auxiliary though important part in sex differentiation and may well account for the lack of masculation in some cases of arrhenoblastoma. Thus, in a case of pseudohermaphroditism in which feminine traits predominate, the only gonads present may be testes. Masculation in a person with arrhenoblastoma usually disappears with the removal of the affected ovary unless recurrence takes place on the opposite side (Moots).

Fibrosarcoma of Soft Parts.—In an effort to answer the question of the choice of treatment for fibrosarcoma of the soft parts that is constantly recurring, with proponents of radical or conservative surgical intervention and of irradiation, Warren and Sommer analyzed the records of 163 cases of the New England Deaconess Hospital. Fibrosarcoma was found not to be a disease of the young, the mean age at onset in both sexes was about 50 years. Trauma was not an etiologic factor. Most patients have been treated by operation. Radiation therapy has been disappointing. The interval from the onset of symptoms to the beginning of treatment bears no definite relation to the outcome of the treatment. The neurogenic fibro-

sarcoma may be recognized as a definite subtype. The appearance of tumor giant cells indicates higher malignant incidence, as was evidenced by a higher mortality and a shorter duration of the disease in the cases studied. Recurrence is frequent (sixty-four cases) and has grave prognostic significance. However, eight patients are alive and well three years after treatment of their last recurrence. Recurrence usually is early and is rare after the first year. Metastasis is infrequent (thirty-four cases) and usually occurs after local recurrence. Metastasis is most frequent in the lungs and may involve regional lymph nodes. Fibrosarcoma involving the head or neck is serious: only 21 per cent of the patients are alive and well three or more years after the onset. Seventeen cases of adenofibrosarcoma of the breast are reported; all but one of the patients have recovered. Lymph nodes were not involved. In two cases fibrosarcoma was apparently secondary to changes caused by irradiation. Ten instances of multiple tumor were found.

Test of Circulation in Venous System of Lower Extremity.—Mahorner and Ochsner determine the direction of flow of blood in the venous system of the lower extremity affected by varicosities and evaluate the competence of the valves of the long saphenous vein and communicating veins between the superficial and the deep systems of the thigh in the following manner: The degree of prominence of the varicose veins on standing is observed. It is essential to have a good light placed behind the observer, whose horizontal plane of vision is not much higher than the hips of the patient, and directed toward the area of the room immediately in front of him. The patient then walks to and fro, and any changes in the size of the veins as compared with their size in the standing position are noted. Usually as the patient walks the veins become less prominent, owing to efficient pumping action by the muscles on the deep veins. After the patient has passed in review several times, a tourniquet of thin rubber tubing is tied around the upper third of the thigh, sufficiently tight to compress the superficial veins. The patient then walks at the same rate of speed over the same course as before, and the relative size of the veins is compared with their size when the patient walks without the tourniquet. Usually there is marked diminution (from 50 to 75 per cent) in the prominence of the varicosities. The patient stops walking, and the tourniquet is removed and reapplied in the middle third of the thigh, again sufficiently tight to obstruct the flow of blood in the superficial veins. The patient again walks, and the prominence of the veins in the leg is compared with their appearance when the patient walks without the tourniquet and with the tourniquet applied around the upper third of the thigh. Similarly, the patient walks with the tourniquet around the lower third of the thigh. Frequently, when the improvement in appearance is only moderate with the tourniquet around the upper third of the thigh, it is marked when the tourniquet is around the lower third. In general, this test may have three results: 1. A frequent observation (40 per cent of the instances) is that improvement is greatest when the patient walks with the tourniquet around the lower third of the thigh and less when the tourniquet is around the middle or the upper third of the thigh, but that even then it is more marked than when the patient is walking without the tourniquet. 2. The most frequent observation is that there is no difference in the size of the veins when the tourniquet is in any one of the three positions and that yet there is definitely more improvement when the tourniquet is around the thigh than when it is not. 3. Least frequently there is no improvement with the tourniquet or the veins are more prominent when the tourniquet is around the thigh than when it is not. If the test shows that the communicating veins between the superficial and the deep system are markedly incompetent and high ligation is made, the patient is somewhat benefited, but little more than if a sclerosing solution should be injected into the veins of the calf without ligation. In instances in which this condition exists, low ligation gives by far the greatest immediate improvement. Because fewer recurrences through collateral veins follow high ligation, in addition to this procedure low ligation may be made for an optimal effect and to prevent recurrence through communicating veins.

Colorado Medicine, Denver

33: 593-664 (Sept.) 1936

Pollution of Animas River. J. R. Earp, Santa Fe, N. M.—p. 606.
*Liver Failure: Cause of Unexpected Postoperative and Organic Death. G. Z. Williams, Denver.—p. 609.
Rocky Mountain Spotted Fever. R. L. Cleere, Denver.—p. 617.

Liver Failure.—Williams discusses the accumulating evidence which points to liver failure as the cause of many unexplained deaths. The syndromes characterizing these deaths are divided into three classes: 1. Those in which there is a sudden onset with high fever, coma and rapid death, without signs of uremia; at necropsy, only necrosis of liver cells is found. 2. Those in which there is a similar picture with later onset and longer duration, with more gradual increase in symptoms including signs of uremia before death; necropsy discloses liver damage of varying degree accompanied by degeneration of renal tubule cells. 3. Those cases in which slowly increasing exhaustion, muscular weakness, subnormal temperature and decreasing blood pressure progress to terminal vascular collapse, coma and prostration; necropsy usually shows some change of the liver cells, if not definite necrosis. Liver deaths are not limited to postoperative incidence but occur also in many organic diseases of chronic debilitating nature, acute toxemias, liver trauma and certain drug poisonings. Liver functions cannot be quantitatively determined by any single test, but several reliable tests simultaneously performed are required. The incidence of so-called liver death may be markedly lowered by avoiding surgery when patients are found to possess low physiologic hepatic reserves and by rehabilitating the livers of these patients. Postoperative support of liver function is emphasized. Forcing fluids in large quantities by all routes dilutes excessive toxins in their passage through the liver, adrenals and kidneys and promotes excretion of these harmful substances. Intestinal elimination by mild saline catharsis avoids undesirable absorption of putrefaction products. Reducing ingested proteins diminishes the load of toxic protein decomposition compounds on the liver cells. Increasing carbohydrate intake by large amounts may rapidly build up liver glycogen reserve and combat catabolic degeneration of liver cells. Administering large amounts of calcium intravenously as the gluconate, when urgent, stimulates liver functions and speeds its recovery. Giving dilute hydrochloric acid by mouth to replenish blood and tissue chloride depletion helps to maintain normal water balance. The acid, further, greatly aids intestinal absorption of calcium. Injections of adrenal cortex extract intramuscularly, if available in biologically active preparations, will definitely aid in supporting the patient's overtaxed adrenals. Ingestion of adequate quantities of sodium ions is of equal importance for promoting function. These principles of treatment are equally valuable in preoperative rehabilitation of physiologic hepatic reserve and postoperative promotion of liver metabolism.

Johns Hopkins Hospital Bulletin, Baltimore

59: 73-132 (Aug.) 1936

Mesenteric Tumor Associated with Pregnancy: Report of Case. E. Henriksen, Baltimore.—p. 73.
*Jaundice: Methods of Diagnosis and Treatment of Its Causes. L. Martin, Baltimore.—p. 78.
Progressive Exophthalmos Following Thyroidectomy. H. M. Thomas Jr. and A. C. Woods, Baltimore.—p. 99.
Studies on Immunizing Substances in Pneumococci: V. Effect of Alkalis on Immunizing Properties of Type I Pneumococcus Polysaccharide. L. D. Felton and B. Prescott, Baltimore.—p. 114.

Jaundice.—Martin believes that, in discussing the subject of jaundice, there is a tendency to overemphasize the chemical approach and to fail to develop the clinical side. With jaundice established it is possible, with the aid of the history, physical examination and various tests, to locate the source of the mischief in a large proportion of patients. The more common routine laboratory examinations, including Van den Bergh tests and determinations of urobiligenuria and bilirubinuria, are most often sufficient for a diagnosis. The diagnosis once made, therapy, be it specific, supporting or surgical, may then be instituted. There will be a certain number of cases in which the diagnosis will remain unsolved. In these the most important decision will lie between the choice of medical or surgical treatment. In youth and early adult life the pathologic condition of the liver is generally a hepatitis for which surgery

affords no aid. In later life the importance of the consideration of surgery is paramount. A stone of the common duct, if permitted to obstruct for too long a period, will cause destruction of liver cells. In cases of carcinoma of the head of the pancreas, surgery is not only palliative but of value in prolonging and affording a comfortable existence. Beyond middle age, when the diagnosis lies between some obstructive condition and a hepatitis (generally infectious), surgery is indicated after an adequate period of observation. Lives may be saved, and, if the condition turns out to be one of a medical type, little damage has been done, particularly if there has been proper preoperative care and the choice of anesthetics has been limited to those least toxic to the liver.

Journal of General Physiology, New York

19: 899-1022 (July 20) 1936

Kinetics of Saponification of Iodoacetic Acid by Sodium Hydroxide and by Certain Alkaline Buffer Solutions. R. Brdička, Berkeley, Calif.—p. 899.

Adsorption of Egg Albumin on Collodion Membranes. P. Dow, New Haven, Conn.—p. 907.

Ionic Transference Numbers in Cellophane Membranes. T. Teorell, New York.—p. 917.

Changes in Thickness of Red Blood Corpuscle Membrane. H. J. Curtis, Cold Spring Harbor, Long Island, N. Y.—p. 929.

Adaptation of Cutaneous Tactile Receptors: IV. Electrolyte Content of Frog Skin. M. A. Rubin, Worcester, Mass.—p. 935.

Id.: V. Release of Potassium from Frog Skin by Mechanical Stimulation. H. Hoagland and M. A. Rubin, Worcester, Mass.—p. 939.

Id.: VI. Inhibitory Effects of Potassium and Calcium. H. Hoagland, Worcester, Mass.—p. 943.

Quantity of Electricity and Energy in Electrical Stimulation. H. A. Blair, Rochester, N. Y.—p. 951.

Intermittent Stimulation by Light: V. Relation Between Intensity and Critical Frequency for Different Parts of Spectrum. S. Hecht and S. Shlaer, New York.—p. 965.

Id.: VI. Area and Relation Between Critical Frequency and Intensity. S. Hecht and E. L. Smith, New York.—p. 979.

Isolation from Beef Pancreas of Crystalline Trypsinogen, Trypsin, Trypsin Inhibitor and Inhibitor-Trypsin Compound. M. Kunitz and J. H. Northrop, Princeton, N. J.—p. 991.

Journal of Immunology, Baltimore

31: 59-166 (Aug.) 1936

Reaction of Normal and Rabbit Pox Immune Adult Rabbits to Vaccination with Vaccine Virus. P. D. Rosahn, C. K. Hu and Louise Pearce, New York.—p. 59.

Reaction of Nursling Rabbit to Vaccination with Vaccine Virus. Louise Pearce, C. K. Hu and P. D. Rosahn, New York.—p. 73.

Diphtheria Toxin-Production on Broths Made from Dried Complete Mediums. W. E. Bunney and Leona E. Thomas, Lansing, Mich.—p. 95.

Specificity of Precipitins for Serum. H. R. Wolfe, Madison, Wis.—p. 103.

*Antibody in Relation to Immunity in Acute Poliomyelitis. J. A. Kolmer, with assistance of Anna M. Rule, Philadelphia.—p. 119.

Lipids and Immunologic Reactions: II. Further Experiments on Relation of Lipids to Type-Specific Reactions of Antipneumococcus Serums. F. L. Horsfall Jr. and K. Goodner, New York.—p. 135.

Reaction Between Diphtheric Toxin and Formaldehyde. Edna M. Follensby and S. B. Hooker, with assistance of Elizabeth H. Tayian, Boston.—p. 141.

New Antigen and Its Use in Serodiagnosis of Syphilis. A. Wadsworth and Rachel Brown, Albany, N. Y.—p. 155.

Antibody in Relation to Immunity in Poliomyelitis.—Kolmer discusses the possible bearing the relation of antiviral antibody has to resistance and immunity in poliomyelitis, realizing that humoral immunity was probably only part of the mechanism and that tissue immunity may be more important. He believes that this antibody plays some part in both natural and acquired resistance. The amounts occurring in the blood of normal and convalescent human beings do not appear sufficient to establish its value clearly in passive immunization of human beings in the amounts that have been commonly administered, but there is no reasonable doubt that large doses are sometimes capable of protecting a percentage of monkeys when given within a day or two after inoculation with the virus. While this antibody can be produced by the immunization of horses, goats and sheep with the virus, it may be that both monkeys and human beings produce it more readily, probably because both are susceptible to the virus. It is also true that this antibody is apparently without any neutralizing effect on intracellular virus, so that it has proved without benefit in the treatment of both monkeys and human beings, once pronounced paralysis has occurred. But it would appear that large amounts are capable of preventing the virus from entering cells, and, if this is true, its production by vaccination with active virus may be of real value in addition to tissue immunity in affording protection against the disease. Its administration in large doses to human beings with paresis or early paralysis may prevent progressive infection of the spinal cord, so that its therapeutic value in human beings, while uncertain, is by no means clearly disproved. Whether or not some human beings are constitutionally unable to produce the antibody in sufficient amounts to prevent the paralytic type of the disease, when infected with the virus or on vaccination, is both likely and expected just as has been found true in antibody production and immunity against smallpox, diphtheria, typhoid and scarlet fever. Investigations indicate, however, that multiple doses of ricinoleated vaccine are capable of producing the antibody in children in amounts comparable to those found in the blood of convalescents and normal adults. Whether or not immunization with ricinoleated vaccine of active virus engenders a protective degree of tissue resistance in the absence of demonstrable amounts of neutralizing antibody cannot be stated, but both the possibility and the probability exist.

Journal of Thoracic Surgery, St. Louis

5: 567-692 (Aug.) 1936

Special Training for Thoracic Surgery. C. Eggers, New York.—p. 567

Training of Thoracic Surgeon from Standpoint of the General Surgeon. E. A. Graham, St. Louis.—p. 575.

Training of Surgeon Who Expects to Specialize in Thoracic Surgery. J. Alexander, Ann Arbor, Mich.—p. 579.

Training of Thoracic Surgeon from Standpoint of the Phthisiologist. E. N. Packard, Saranac Lake, N. Y.—p. 583.

Wounds of the Heart: Report of Thirteen Cases. D. C. Elkin, Atlanta, Ga.—p. 590.

*Further Data on Establishment of New Blood Supply to Heart by Operation. C. S. Beck, Cleveland.—p. 604.

Reduction of Cardiac Irritability by Epicardial and Systemic Administration of Drugs as Protection in Cardiac Surgery. F. R. Mautz, Cleveland.—p. 612.

Study of Cardiopericardial Adhesions. R. M. Hosler and J. E. Williams, Cleveland.—p. 629.

Superior Vena Caval Thrombosis: Review of Literature and Report of Cases of Traumatic and Infectious Origin. A. Ochsner and J. L. Dixon, New Orleans.—p. 641.

Establishment of New Blood Supply to Heart by Operation.—Beck reports that up to the present time he has operated on eleven patients with sclerosis of the coronary arteries and angina pectoris. These patients were totally disabled and constituted an extremely bad risk group for any operative procedure. Six patients are living and five are dead. The tissues available to the heart for a blood supply are the pectoral muscle, the triangularis sterni muscle, the intercostal muscle, the intercostal vessels, the internal mammary vessels, subcutaneous fat, mediastinal fat and the parietal pericardium. Two developments are being carried out. One concerns the reduction in irritability of the heart at the operating table by the application of drugs to the surface of the heart; the other consists in making a vascular bed available to the myocardium by a much more simple type of operation. The author says that in his first experiments, which he conducted in collaboration with Tichy, the mesothelial envelop around the heart was destroyed by roughening the lining of the parietal pericardium and also the epicardium by means of a bur. A new vascular bed was constructed by bringing various grafts onto the myocardium. The tissues that were used for the new vascular bed were fibrous pericardium, pericardial fat, pedicle grafts of skeletal muscle from the chest wall, and omentum brought up through an opening in the diaphragm. Anastomoses between the grafts and the heart could be demonstrated in three weeks after the grafts were placed. Anastomoses increased after a physiologic need for blood was established in the myocardium. The physiologic need for blood is perhaps more accurately defined as a pressure differential between the two vascular beds. It was produced by occlusion, partial or complete, of major coronary arteries. After citing several other experiments by which the heart was given a collateral vascular bed, the author says that two types of experiment are presented for comparison: A. Complete ligation in one stage of four or five peripheral branches of the coronary arteries over the apex of the left ventricle was always fatal; ventricular fibrillation developed. B. The right and both major branches of the left coronary

arteries could be occluded by about one third of their cross-section in one stage with recovery. The total amount of blood going through the coronary system in A can be assumed to be greater than in B, yet A was a fatal experiment and B resulted in recovery. These experiments bring out an entirely new point so far as the heart is concerned; namely, the importance of an equal distribution of blood to the myocardium. Total coronary blood flow is one factor that concerns the preservation of the heart beat, but distribution of blood flow is another important factor. The collateral vascular bed can function in effecting an equal distribution of blood to various parts of the myocardium. This is done in two ways: first, by bringing blood from extracardiac sources into the myocardium, and, second, by transporting blood from one part of the heart where the circulation is good to another part of the heart where the circulation is deficient. In the latter respect the grafts act as anastomotic bridges connecting the beds of different vessels.

Medical Annals of District of Columbia, Washington

5: 223-254 (Aug.) 1936

Administration of Digitalis. L. C. Ecker, Washington.—p. 223.
Action of Digitalis in Congestive Heart Failure. B. W. Leonard, Washington.—p. 227.
*Clinical Application of Venous Pressure Measurement. H. H. Hussey, Washington.—p. 232.
Clinical Significance of Blood Circulation Time as Determined by Saccharin Test. L. M. Drennan Jr., Washington.—p. 238.
Hepatosplenography with Stabilized Thorium Dioxide Solution: Follow-Up Study of 200 Patients Examined Over Period of Five Years. W. M. Yater, L. S. Otell and H. H. Hussey, Washington.—p. 241.
Acromegaly: Case Study from the George Washington University Endocrine Clinic. Elizabeth Parker and H. S. Douglas, Washington.—p. 247.

Clinical Application of Venous Pressure Measurement.—Hussey says that he used a method and an apparatus devised by Griffith, Chamberlain and Kitchell. The apparatus consists of a 20 gage needle and a 2 cc. syringe having a sidearm to which a calibrated glass measuring tube is connected by means of rubber tubing of about the size of a 14 F. catheter. The other end of the glass tube is connected by means of another short piece of rubber tubing to a glass reservoir of any description. The entire apparatus can be sterilized by boiling. Physiologic solution of sodium chloride is placed in the reservoir and allowed to fill the set, which is then ready to use. The patient is placed in the supine position, a vein is selected at the elbow, and the needle of the apparatus is introduced into the vein. The plunger of the syringe is drawn back, allowing saline solution to run through the sidearm into the syringe and thence into the vein. Next, the reservoir is detached from the apparatus and the zero point of the calibrated tube is placed on a plane with the midaxillary line of the patient. This plane has been selected arbitrarily as approximately level with the right atrium of the heart and as a simple means of standardizing readings. The saline solution will continue to fall in the glass tube, fluctuating somewhat with respiration and stopping at a point which indicates the height of the venous blood pressure in terms of millimeters of saline solution. With this technic it has been found that normal persons have a peripheral venous blood pressure of from 40 to 120 mm. of saline solution. The author shows that the principal factors influencing the blood pressure in the peripheral veins of normal persons are the heart action, gravity, the intrathoracic pressure, the blood volume and muscular exercise. He presents the results of study of the venous pressure in 150 selected patients. Right ventricular failure always causes a rise in venous pressure above normal, and this rise may be the means to the establishment of the diagnosis of heart failure. Repeated measurements of venous pressure in patients with congestive heart failure are useful to follow the clinical course of the disease and have considerable prognostic importance. High venous pressures in lobar pneumonia have an unfavorable prognostic significance. Measurement of the blood pressure in the peripheral veins is valuable in the diagnosis of cardiac compression and is helpful in estimating the efficacy of surgical treatment in this condition. Measurement of the venous pressure is useful in the diagnosis of mediastinal tumors and in observing the response of certain types to roentgen therapy. Pleural effusion and pneumothorax do not affect venous pressure unless they are sufficient to provoke dyspnea. Measurement of venous pressure is useful in the regulation of artificial pneumothorax therapy.

Pennsylvania Medical Journal, Harrisburg

39: 845-942 (Aug.) 1936

Clinical Significance of Skeletal Roentgen-Ray Assessment in Children. T. W. Todd, Cleveland.—p. 845.
Artificial Ankylosis of Joints. J. A. Heberling, Pittsburgh.—p. 848.
Blood Pictures in Middle Ear Infection, with Especial Reference to Differential Diagnosis and Prognosis. M. M. Strumia, Bryn Mawr.—p. 852.
Noncalculous Disease of Gallbladder. G. P. Müller, Philadelphia.—p. 857.
*Histidine Treatment of Peptic Ulcer. F. A. Weigand, Philadelphia.—p. 860.
Pityriasis Rubra Pilaris, with Particular Reference to Vitamin Medication and Dietary Control. M. F. Pettler, Beaver Falls.—p. 864.
*Undescribed Lesion of Shoulder Girdle of Frequent Occurrence, with Especial Reference to Sprain of Rhomboideus Minor Muscle. J. P. Replogle, Johnstown.—p. 866.
Inflammation of Urinary Bladder: Report of Case of Gangrenous Cystitis. W. C. Bryant, Pittsburgh.—p. 869.
Ureteral Transplantations. G. V. Foster, Pittsburgh.—p. 874.

Histidine Treatment of Peptic Ulcer.—Weigand shows that histidine treatment consists of the daily intramuscular injection, for twenty-four days, of 5 cc. of a 4 per cent solution of histidine monohydrochloride. No specific dietary regimen is used other than the avoidance of foods obviously so rough as to promise possible mechanical injury. The patient is ambulatory during this treatment and is able to follow his usual daily routine. This treatment was carried out on patients most of whom were in an acute attack. After giving brief histories of twelve of these patients, the author concludes that the intramuscular injection of histidine monohydrochloride should be further studied as a therapeutic measure in the treatment of peptic ulcer. In cases in which recurrence has occurred after surgical intervention, its use should be given consideration. Because of the prompt symptomatic relief afforded, emphasis must be placed on thorough x-ray follow up in addition to the customary clinical observations.

Undescribed Lesion of Shoulder Girdle.—Replogle states that an analysis of 250 successive cases of shoulder injury observed at the Bethlehem Steel Hospital, Johnstown, Pa., excluding burns and minor injuries, revealed twenty-six varieties of lesions in and about the shoulder. Twenty-five per cent of the lesions are sprains. One of the frequent traumatic lesions of the shoulder is sprain of the rhomboideus minor muscle. After describing and explaining the symptomatology of this sprain, which occurs usually in those performing heavy or strenuous labor such as swinging a sledge, firing a furnace or lifting a heavy weight, the author takes up the treatment, showing that it is simple and based on anatomic lines to cause relaxation of the overstretched muscle. The shoulders are thrown back so as to lessen the interscapular space, and wide crisscross adhesive straps are applied for the maintenance of this position. The arm is placed in a sling and a small pad placed under the adhesive plaster over the point of tenderness to hasten the absorption of the serous effusion at the point of rupture or strain. This treatment gives immediate relief from aching, and pain on abduction is greatly reduced. The author several times removed the cross strapping too early, and patients requested its reapplication to obtain relief. He concludes that the frequency of occurrence of sprain of the rhomboideus minor, the unusually constant symptomatology and clinical picture and the efficacy of simple and proper treatment, together with the fact that it is of sufficient seriousness to cause industrial disability, justify a description of the lesion and demand caution in its diagnosis.

Wisconsin Medical Journal, Madison

35: 685-768 (Sept.) 1936

The Nervous Patient in the General Practice of Medicine. F. J. Hirschboeck, Duluth, Minn.—p. 701.
Cancer Mortality in Wisconsin General Hospital. M. Burke, Madison.—p. 709.
Carcinoma of Lung and Its Differential Diagnosis. A. Arkin, Chicago.—p. 719.
Syphilis and Carcinoma of Stomach; Differential Diagnosis in Patients with Systemic Syphilis: Case Reports. Marie L. Carns, Madison.—p. 725.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

20: 497-560 (Sept.) 1936

Some Effects of Gamma Radiation on Developing Rat Retina. A. Glücksmann and Katharine Tansley.—p. 497.
*Inflammatory Disease in Eye Caused by Gout. D. J. Wood.—p. 510.
Swelling Pressures of Normal and Glaucomatous Vitreous Bodies. S. Duke-Elder, H. Davson and G. H. Benham.—p. 520.
Glycerol Trinitrate (Nitroglycerin) in Treatment of Hemeralopia (Night-Blindness). R. de R. Barondes.—p. 528.
Cataracta Brunescens: Study of Nature of Coloring Substance. Elena Puscariu and J. Nitzulescu.—p. 531.
Posterior Needling in Treatment of Lamellar and Other Forms of Soft Cataract. A. J. Ballantyne.—p. 540.
Incidence of Cataract at Certain Age Periods in South Indian Districts. R. E. Wright.—p. 545.

Inflammatory Disease in Eye Caused by Gout.—Cases of ocular disease which correspond exactly with those described by Jonathan Hutchinson, and attributed to gout, are encountered from time to time. During the last fifteen years Wood has dealt with four such cases. In them no other gross or manifest evidence of gout existed, and therefore other and more modern etiologies had been sought without success. The first sign of trouble was an attack of episcleritis fugax, and this continued to form part of the syndrome through the course of the trouble. The proof that gout is the principal cause is partly negative, in that the pathologic conditions do not resemble any others that the author has seen. On the positive side are to be placed the fact that in three cases tenonitis was present and that episcleritis periodica fugax was the commencement in all the cases. In three cases the patient's diet and use of alcohol were such as would naturally produce a gouty condition, and in one the cessation of beer and diminution of a heavy meat diet put an end to the troubles. Besides these points in the two cases in which an examination was made, the uric acid content in the blood was greatly increased during the acute attacks.

British Medical Journal, London

2: 375-412 (Aug. 22) 1936

Ganglionectomy in Treatment of Severe Polyarthritis and Osteo-Arthritis. A. Young.—p. 375.
Maternity Services. E. Maclean.—p. 382.
Id.: Part Played by Education of Medical Students. F. J. Browne.—p. 384.
The Problem of the Midwifery Services from Standpoint of the Country Practitioner. R. E. Moyes.—p. 386.
*Hormone Regulation of Number of Blood Platelets in the Blood. H. Zondek and Kaatz.—p. 387.
Blood Transfusion in Childhood. D. Browne.—p. 389.

Hormone Regulation of Number of Blood Platelets.—Zondek and Kaatz show that the blood platelet count in the peripheral blood is increased by the hormone of the thyroid gland. The action is more constant than in the case of red blood cells. The increase usually appears from twenty-four to forty-eight hours after the administration of the hormone and has disappeared within about seventy-two hours. The thyrotropic hormone acts in the same way, but its action is more protracted. In a case of chronic thrombopenia in a child a gradually increasing number of platelets was counted after repeated administration of thyrotropic hormone (single dosage, 500 rabbit units). Adrenal cortex extract showed a diminishing effect on the number of blood platelets in a large number of experiments, but in several other experiments this result was not obtained.

Edinburgh Medical Journal

43: 481-544 (Aug.) 1936

Formation of Gallstones. C. F. W. Illingworth.—p. 481.
Clinical Recollections and Reflections: V. "Running" Nose. G. E. Martin.—p. 498.
Some Modern Problems Connected with Cerebrospinal Fluid. J. G. Greenfield.—p. 510.
Studies on Carbohydrate Metabolism in Mental Disorders: I. Glucose Tolerance Tests in Manic-Depressive Insanity and Other Depressions. H. Tod.—p. 524.
Virus Bodies in Lymphogranuloma Inguinale (Climatic Bubo). A. C. Coles.—p. 528.

Journal of Physiology, London

87: 199-310 (Aug. 19) 1936

Neuromuscular Transmission in Crabs. B. Katz.—p. 199.
Biologic Assay of Cortical Hormone by Survival Method, in Adrenalectomized Young Rats, and on Influence of Salt Content of Hormone Extract. P. Schultzer.—p. 222.
Renal Elimination of Phenol Red in Dog. H. L. Sheehan.—p. 237.
Sympathetic Vasodilatation in Skin and Intestine of Dog. Edith Bülbring and J. H. Burn.—p. 254.
Respiration and Functional Activity. W. Deutsch and H. S. Raper.—p. 275.
Effects of Vitamin E Deficiency on Thyroid Gland of Rat. Eleanor Singer.—p. 287.
Inhibition of Water Diuresis by Pituitary (Posterior Lobe) Extract and Its Relation to Water Load of Body. Mary Pickford.—p. 291.
Mechanism of Rhythmic Changes in Caliber of Bronchi During Respiration. M. Ellis.—p. 298.

Medical Journal of Australia, Sydney

2: 139-170 (Aug. 1) 1936

The Sir Richard Stawell Oration. T. P. Dunhill.—p. 139.
*Frequency of Micturition in the Female. W. J. Close.—p. 147.
Operation for Thenar Paralysis. N. D. Royle.—p. 155.

Frequency of Micturition in Female.—Close states that it is in the lower part of the urinary tract that the lesions responsible for the ailments of frequent micturition peculiar to women occur; that is, that part which developmentally belongs to the wolffian duct—the trigon, urethra and their adnexal glands. The following pathologic conditions affecting the female urethra and trigon are discussed separately: (1) urethritis, embodying acute generalized infections due to the gonococcus, a gram-negative extracellular diplococcus, Bacillus coli, the enterococcus and mixed organisms, such as staphylococci, diphtheroids and trichomonads, together with the foregoing organisms, and chronic glandular inflammations of the deep "prostatic" glands, submucous follicles or Skene's glands, which may be infective, owing to organisms mentioned, noninfective conditions of the so-called "prostatic" glands or passive venous congestion, (2) stricture of the urethra accompanied by chronic infection as cause or effect, (3) carunculae, (4) trigonitis pseudomembranosa, or trigonitis exfoliativa, (5) senile atrophic urethritis, (6) diverticula, (7) defects in the supports of the lower part of the urinary tract and (8) neuroses.

Japanese Journal of Experimental Medicine, Tokyo

14: 197-310 (June 20) 1936

*Studies on Virus of Lymphogranuloma Inguinale Nicolas, Favre and Durand: Sixth Report: Inoculation Experiment of Virus in Small Laboratory Animals Beside Monkeys and Mice. Y. Miyagawa, T. Mitamura, H. Yaoi, N. Ishii and J. Okanishi.—p. 197.
Id.: Seventh Report: Cultivation of Virus by Tissue Culture Method. Y. Miyagawa, T. Mitamura, H. Yaoi, N. Ishii, J. Okanishi, T. Goto and S. Shimizu.—p. 207.
Id.: Eighth Report: Studies on Cultivation of Virus After Tamura, Meyer and Anders' Reports. Y. Miyagawa, T. Mitamura, H. Yaoi, N. Ishii, J. Okanishi, K. Kanazawa and H. Yamada.—p. 221.
Experimental Studies on Mechanism of Development of Pneumonia by Pneumococcus Residue Substances. H. Nakajima.—p. 239.
Influence of Lymph Gland and Other Organ Cell Constituents Introduced Parenterally on Blood Lipase Content. M. Yamaguchi.—p. 273.
Specific Toxic Substance of Bacillus Dysenteriae Komagome B_1 (Flexner-Type). K. Kobayashi.—p. 295.

Virus of Inguinal Lymphogranuloma.—Miyagawa and his co-workers found that by the intracerebral inoculation of inguinal lymphogranuloma virus only squirrels among guinea-pigs, albino rats and domestic fowls show typical cerebral symptoms with typical pathologic changes and numerous special granulocorpuscles. Under the intratesticular inoculation there appeared typical pathologic changes and granulocorpuscles in the albino rats and squirrels but not in the guinea-pigs and rabbits. The affected testicular material is capable of causing typical infection with special granulocorpuscles in mice. By the intradermal inoculation into guinea-pigs, albino rats, rabbits, squirrels and domestic fowls, typical papules occurred with special granulocorpuscles in the guinea-pigs, albino rats, mice and squirrels; and the content of the papules caused typical symptoms by means of intracerebral inoculation into mice. By the dermal passage of the virus, the virulence of which was already decreased in the successive passage through mice brains and through guinea-pigs and albino rats, the virulence of the virus increases so remarkably that it again causes severe symptoms in mice. From this fact it may be said that the virus has a certain dermotropism. Special granulocorpuscles are always found when the disorder is produced distinctly.

Archives de Médecine des Enfants, Paris

39: 569-632 (Sept.) 1936

Xanthomatosis of Skin and Hand-Schüller-Christian Syndrome. J. R. Dreyfus.—p. 569.

*Treatment of Infantile Diarrheas by Raw Apples. S. F. Bakal and R. M. Sigal.—p. 578.

Pyelitis of Nursling and Young Child. S. Mekler.—p. 585.

Treatment of Infantile Diarrhea by Raw Apples.—Bakal and Sigal report fifty-one cases of infantile diarrhea. Twenty-eight children were less than 2 years of age, eighteen were between 2 and 5 and five ranged from 6 to 10. In all instances the authors introduced a forty-eight hour diet of apples without preliminary treatment. In only two cases did the diet last only one day because the children refused the apples. The skins and cores of the apples were removed. In most instances the children ate the apples willingly. During this diet the patients received no other nourishment. Liquids were given as needed. The first day of transition toward a regular diet the patients were given such foods as rice gruel, bouillon and gelatin. By the third day vegetable purée could be given. The results obtained were good. During the first day the stools became thick from five to seven hours after the first apple meal and developed the odor and appearance of puréed apples. Toward the end of the second and third days the stools became formed, the general condition improved, the toxic phenomena disappeared and the temperature fell. During the apple diet the weight of the children decreased, but it returned rapidly to normal later. The history of the illness was almost the same in all the cases. The authors believe that the rapidity of action, the duration of effect and the absolute innocuousness of the apple diet should lead toward application of this method not only in the clinic but also in ambulatory practice.

Journal de Médecine de Lyon

17: 563-592 (Sept. 5) 1936

*Acute Curable Subarachnoiditis in Young Subjects. J. Chalier, M. Plauchu and L. Badinand.—p. 563.

*Measles Meningo-Encephalitis. J. Chalier, M. Plauchu and L. Badinand. —p. 579.

Subarachnoiditis in Young Subjects.—Chalier and his colleagues report twenty personally observed cases of acute benign lymphocytic meningitis in young subjects. They believe that the latter name is inappropriate. Actually the cerebrospinal fluid albumin is ordinarily little increased, certainly less than in acute or subacute meningitis. By contrast the level of sugar instead of decreasing as in meningitis is in general increased initially and returns rapidly to the neighborhood of normal. The leukocytosis, which is marked at the beginning, does not increase as in tuberculous meningitis but usually decreases with rapidity. A cytologic examination reveals the frequent presence of cells the characters of which allow them to be classed with the monocytes. Because of their frequently elevated level, these elements, so far poorly understood, have, an important prognostic value. They augur a recovery. The chemical observations oppose the opinion that this is a true meningitis. Furthermore, the frequently elevated number of monocytes testifies against the qualification of the term meningitis by adding "lymphocytic." The term that seems in the authors' opinion to describe the condition best is "acute, curable subarachnoiditis in young subjects."

Measles Meningo-Encephalitis.—Chalier and his colleagues discuss the meningeal and encephalitic manifestations of measles. They report ten cases personally observed. These complications almost always arise after the disappearance of the measles exanthem. They consist, according to the case, in convulsions, torpor, somnolence, coma, hyperthermia and meningeal signs. Various forms can be described: (1) acute or subacute generalized forms, (2) a localized hemiplegic form, (3) a form of hemorrhagic meningo-encephalitis, (4) a pure or predominantly meningeal form and (5) a slight or larval form. The cerebrospinal fluid shows a slight increase in albumin and sugar and a slight or marked cellular reaction, usually in the form of lymphocytes and monocytes. The diagnosis must be differentiated especially from the meningo-encephalitis due to otitis and mastoiditis. Hyperthermia or association with a bronchopneumonia constitutes the most unfavorable prognostic sign. The anatomic foundation is represented especially by generalized deterioration of the brain, predominantly in the white substance. Microscopically, this is revealed by multiple lesions, inflammatory, degenerative and proliferative. The pathogenesis remains an object of discussion. If there exists a post measles meningo-encephalitis, is it or is it not due to the measles virus? Further research is necessary on this point.

Archivio di Ostetricia e Ginecologia, Naples

43: 319-396 (Aug.) 1936

*Rupture of Uterus. G. Tesauro.—p. 319.

Rupture of Uterus.—According to Tesauro spontaneous or posttraumatic rupture of the uterus complicating labor takes place more frequently in multiparas than in primiparas and generally in women more than 35 years of age. The frequency of the complication is 0.3 per cent. Predisposition of the uterine wall due to lesser resistance of the organ by previous febrile puerperiums, obstetric operations and inflammatory or cicatricial processes exists in most cases. The author reports thirty cases. Spontaneous rupture was produced in the scar of a myomectomy in one, by shoulder presentation in four, by pelvic stenosis in two, by face presentation in one and for other causes in six women with normal pelvis and fetuses in vertex presentation. The rupture was complete in twenty-three cases: it took place at the lower segment of the uterus in twenty-two and at the fundus in one. In one case the bladder and in another the vagina and the bladder were involved in the tear. Subtotal hysterectomy was performed in twenty-nine cases. A drain left in the ruptured area (subperitoneal) was the only treatment in one case. Hysterectomy was closed without drainage in one case, after a Mikulicz drain had been left in three cases and two drains in twenty-three. In the latter group a Mikulicz drain and an abdominal and vaginal gauze drain were left. According to the author, this is the reason for the great number of recoveries obtained (74 per cent). Two patients died during the operation, six from septic or pulmonary complications within five days and one, from embolism, within twenty-five days of the operation. The operative mortality rate was 25 per cent.

Haematologica Archivio, Pavia

17: 553-644 (No. 7) 1936

Metabolism of Proteins Following Transfusion of Homologous Blood in Dogs in Sustained Nitrogen Equilibrium. C. Zummo.—p. 553.

Diameter of Erythrocytes in Normal and Pathologic Conditions. G. Cozzutti.—p. 567.

*Neurologic Complications of Pernicious Anemia: Clinical Study. A. Baserga.—p. 603.

Neurologic Complications of Pernicious Anemia.—Baserga reviews the literature on neurologic complications of pernicious anemia. There are two types of neurologic complications: those of moderate intensity in pernicious anemia not treated with liver and those of the typical subacute combined degeneration of the spinal cord (Lichtheim syndrome). Neurologic complications of moderate intensity are so frequent that they are considered characteristic symptoms of pernicious anemia. Grave forms are rare. They result in invalidism by paralysis and develop only in patients who have suffered long and been insufficiently treated. Intramuscular injections of liver in daily doses corresponding to 700 Gm., if given by mouth and for long periods, would prevent neurologic complications, control those already developed and, in some cases, result in regression of the symptoms. Discontinuation of the treatment results in immediate diminution of hemoglobin in the blood and aggravation of the symptoms, which sometimes do not regress. Once regression of the symptoms or improvement of the blood takes place, injections of liver extract corresponding to 5,000 Gm. of liver should be given once a week or every other week. The frequency of the injections is determined by controlling the amount of hemoglobin in the blood by weekly blood examinations in order to maintain hemoglobin at not lower than 100 for men and 90 for women. The treatment in these cases should be given without interruption for a period varying from fourteen months to three years. Large doses of iron and physical reeducation are resorted to as complementary treatments. The author discusses the economic aspect of liver treatment.

Discontinuation of the treatment because of the patient's financial status is the main cause of the neurologic complications. It is advisable to establish centers, supported by the government or the community, for free administration of liver treatment to those unable to pay for it. The expenses of these centers will be small compared to those of supporting invalids from the disease. Two cases of the typical and atypical forms, respectively, are reported by the author.

Policlinico, Rome

43: 407-478 (Sept. 15) 1936. Surgical Section

*The Sodium Salt of *n*-Methyl-Cyclo-Hexenyl-Methyl Barbituric Acid and Tetanus Antiserum in Experimental Tetanus. S. Caminiti.—p. 407.
"Mens Agitat Molem": Psychic Influences on Etiopathogenesis of Gastric Ulcer. B. Schiassi.—p. 425.
Adamantinoma of Lower Jaw: Cases. G. Selvaggi.—p. 454.

Experimental Tetanus.—Caminiti says that hyperthermia, induced by pyretogenic substances, fails in treating experimental tetanus. Conflicting opinions are reported in the literature on the therapeutic value of several forms of anesthesia. The author made experiments on rabbits and found that ethyl chloride, chloroform and ether anesthesia fail to retard fixation of the toxin on the nervous tissues, to free the toxin from the tissues and to make it liable to be neutralized by the antitoxin in the blood. Rabbits treated with the anesthetics died early in the course of experiments. The sodium salt of *n*-methyl-cyclo-hexenyl-methyl barbituric acid associated with tetanus antiserum in large doses (1,500 Rosenau units for each injection given intramuscularly) gave satisfactory results. The greater number of rabbits that received the combined treatment thirty-six and forty hours after inoculation of the toxin and eighteen and twenty-four hours after onset of contractures survived the disease. The action of the treatment seems to be due to sedative and antispastic properties of the sodium salt of *n*-methyl-cyclo-hexenyl-methyl barbituric acid by which the excitability of the nervous tissues diminishes and the tissues become permeable to the entrance of antitoxins. The development of the disease is favorably modified, especially by great attenuation of the nervous symptoms of the clonic-tonic type. The results of the experiments, according to the author, indicate the advisability of the use of the combined treatment in tetanus in human beings for evaluation of clinical results.

Rivista di Chirurgia, Naples

2: 385-436 (Aug.) 1936

Results of Experimental Cholecystectomy on Structure of Extrahepatic Bile Ducts. M. Barbiroli.—p. 385.
Painful Ankylosing Spondylitis: Unilateral Recovery Through Parathyroidectomy. G. Greco.—p. 391.
*Primary Giant Cell Tumors of Patella: Case. E. Sorge.—p. 399.

Primary Giant Cell Tumors of Patella.—According to Sorge, the number of cases of primary giant cell tumors of the patella reported in the literature is sixteen, including his own. He reviews the operation performed in each case and the results reported. In his case he resorted to rotulectomy followed by reconstruction of the extensor femoris muscles and plastic correction of the tendon of the quadriceps by means of a flap, previously prepared. The operation was satisfactory as to cosmetic and functional results (complete extension of the leg and active flexion of the knee joint of about 130 degrees). Functional improvement is expected from time and physical exercise.

Arch. Arg. Enf. d. Ap. Dig. y Nutri., Buenos Aires

11: 555-710 (Aug.-Sept.) 1936. Partial Index

*Magnesium Sulfate in Vomiting of Pulmonary Tuberculosis. A. A. Raimondi, A. Sangiovanni and L. E. Camponovo.—p. 555.
Roentgen Diagnosis of Incomplete Chronic Obstruction of Jejunum and Ileum. P. A. Maissa.—p. 566.
*Influence of Bile and Bile Salts on Vaginal and Intestinal Trichomonas. Ida Fischer.—p. 660.
Grave Hemorrhagic Colitis. A. Yodice.—p. 668.
Etiology of Intestinal Toxemia. H. J. D'Amato.—p. 672.

Treatment of Vomiting in Pulmonary Tuberculosis.—Raimondi and his collaborators find magnesium sulfate efficacious in the treatment of alimentary vomiting not originated in any pathologic gastric condition and complicating pulmonary tuberculosis. It is advisable to resort to the treatment as soon as vomiting begins, not only to prevent denutrition and psychic reactions of the patient but also to improve his general condition. The treatment consists in subcutaneous or intramuscular injections of from 3 to 5 cc. of a 12 per cent solution of magnesium sulfate to which a 1 per cent solution of procaine hydrochloride or 0.02 Gm. of paraphenolsulfonate of ethylaminobenzoate for each 5 cc. of the solution is added. Two daily injections are given, each of which is administered half an hour before meals. Vomiting is controlled in all cases after the first few injections. It is advisable, however, to give the treatment for ten days to consolidate the satisfactory results and to repeat it at any time if vomiting reappears. The treatment may be used in pregnant tuberculous women; it does not interfere with the digestive functions and is better than other medical treatments that are now used for the condition.

Influence of Bile Salts on Vaginal and Intestinal Trichomonas.—Fischer experimented in vitro and found that bile, in normal condition, develops a proteolytic action on vaginal and intestinal Trichomonas. The toxic action of bile depends on its concentration, which in turn depends on the normal function of the liver. Greatly diluted bile favors the development of Trichomonas. Sodium cholate, glycocholate and taurocholate are parasiticides for Trichomonas.

Crónica Médica, Lima, Peru

53: 249-280 (July) 1936

*Treatment of Erysipelas by Ultraviolet Rays. R. F. Desmaison.—p. 249.
Accidents and Complications of Phrenicectomy. O. Hercelles García.—p. 257.
Clinical Forms of "Dangerous Psychic-Criminologic Personal Conditions." Susana Solano.—p. 265.
Complete Impotence from Tabes Dorsalis: Case. L. Avendaño and C. A. Bambarén.—p. 269.

Treatment of Erysipelas by Ultraviolet Irradiations.—Desmaison resorted to ultraviolet irradiations in treating erysipelas of the medical or surgical type. Care should be taken that the eyes of both the patient and the roentgenologist are protected by glasses. He prefers Hanan's mercury vapor lamp because of the regularity of the radiations emitted. The lamp should be focused at a distance of 50 cm. so that the beam touches the skin obliquely or horizontally in relation to the position of the patient without bringing him directly under the lamp but beside it. The irradiation covers not only the involved area but the surrounding zone of apparently normal skin as well. Treatments are given daily or every other day with a duration of five minutes for the first and ten minutes for the following irradiations. The complete treatment consists of from three to six irradiations. It gives immediate sedation of the local and general phenomena and complete control of the disease, generally after the third irradiation and rarely after the fifth or sixth. The efficacy of the treatment is the same in patients suffering from erysipelas, but otherwise normal, as in those with diminished organic resistances and physiologic insufficiency. Pulmonary tuberculosis, myocarditis, heart diseases in decompensation and certain dermatitis of the vesiculous type are contraindications of the treatment.

Semana Médica, Buenos Aires

43: 757-824 (Sept. 17) 1936. Partial Index

Surgery of Lumbar Sympathetic. J. Arce and A. S. Introzzi.—p. 766.
Abscess of Lung: Rare Complications; Case. C. Patiño Mayer, E. Pittaluga and A. Montenegro.—p. 769.
*Transfusion of Preserved Blood. A. O. Tachella Costa.—p. 783.
Antityphoid Vaccination in Course of Epidemics: Results. P. J. Lanzani.—p. 790.
Silent Spontaneous Pneumoperitoneum in Pulmonary Tuberculosis Complicated by Duodenal Ulcer: Case. S. Gertzenstein and N. Moguilner.—p. 803.

Transfusion of Preserved Blood.—Tachella Costa states that blood from living persons preserved at a temperature of 4 C. keeps its therapeutic properties for eight days when preserved in an isotonic citrated solution and for several weeks when preserved in a dextrose solution. When compared with direct transfusion from donor to patient, preserved blood transfusion has the following advantages: same efficacy, more exact serologic control of the blood in relation to possible contamination and blood grouping, easier technic, lower cost and opportune availability. These advantages prove the advisability of

using preserved blood. Surgical clinics and emergency departments, even those located in small communities, should have a department for blood transfusion with a supply of preserved blood available at all times. The author does not consider transfusion of preserved blood from cadavers, since it is difficult to obtain cadavers of normal persons who have died suddenly and to be sure of the preservation of the cadaver before taking the blood. Another great objection is the repugnance of patients to be treated with blood of cadavers.

Medizinische Klinik, Berlin

32: 993-1028 (July 24) 1936. Partial Index

Sport and Nutrition. C. von Noorden.—p. 993.
Allergy and Disease. T. Brugsch and A. Sylla.—p. 996.
Changes in Thyroid Tissue Under Iodine Treatment. H. Willer.—p. 999.
Pancreatitis in Diseases of Bile Tract. H. Horsters.—p. 1003.
Significance of Roentgen Examination of Gastric Mucous Membrane. G. Velde.—p. 1006.
*Histidine Treatment in Disorders Accompanied by Ulceration, Particularly in Colitis Ulcerosa and Bronchiectasis. H. Kahler and H. Duregger.—p. 1009.
*Intravenous Galactose Tolerance Test. K. Hitzenberger and E. Fantl.—p. 1017.

Histidine Treatment in Ulcerating Disorders.—Kahler and Duregger were able to corroborate the favorable action of histidine on gastric and duodenal ulcers in forty cases. They employed a sterile 4 per cent isotonic solution of histidine monohydrochloride, using ampules of 5 cc. each for intramuscular injections. In the majority of the cases they observed disappearance of the pains after the third or fourth injection and at the end of the histidine treatment (from eighteen to twenty-five injections) they nearly always observed that the objective ulcer signs subsided (muscular stiffness, pressure points and occult hemorrhages). The roentgenogram likewise revealed improvement. It is especially noteworthy that, in contradistinction to other internal methods of ulcer treatment, histidine therapy is effective also if no particularly strict diet is adhered to. In four cases relapses appeared after four and eight months respectively, but renewed treatment with histidine was again successful. The authors decided to try this treatment also in other disorders that are accompanied by ulcer formation. They found that in ulcerative colitis histidine injections result in rapid improvement, which can be proved rectoscopically. In large pulmonary abscesses histidine treatment was ineffective, but in small pulmonary abscesses improvements were observed. Many cases of bronchiectasis responded favorably to histidine treatment in that the quantity of the sputum and its bad odor were nearly always reduced. The authors think that the fact that histidine is effective in ulcerative processes of various organs indicates that it exerts a direct influence on the chemistry of the diseased tissues.

Intravenous Galactose Tolerance Test.—Hitzenberger and Fantl point out that, in oral tolerance tests with 40 Gm. of galactose, cases are frequently detected in which no galactosuria results. This so-called agalactosuria was considered by some authors as a differential diagnostic sign of pernicious anemia. It was soon found, however, that this sign appeared also in other forms of anemia and even in disorders without anemia. Further, the authors mention investigators who assumed that disturbances in the intestinal absorption or in the renal function might be a cause of the agalactosuria. They point out that in the latter cases there should be a high galactosemia. They observed a patient with parenchymatous icterus of such severity that acute atrophy of the liver had to be suspected. Repeated oral galactose tolerance tests (40 Gm. of galactose in 400 cc. of tea) disclosed complete agalactosuria. Although the patient was free from noteworthy intestinal disturbances, a defective resorption was suspected as the cause of the agalactosuria, for renal disorders were likewise absent. In order to detect the possible disturbance in the intestinal resorption, the authors made an intravenous injection of galactose and at once observed a severe galactosuria. Following preliminary tests they found that 40 Gm. of galactose must be administered intravenously in order to obtain practical results. They now make the intravenous galactose tolerance test with 40 Gm. of galactose in the form of a 40 per cent solution. They stress that with this test the always doubtful component of intestinal absorption can be eliminated. They found that normal subjects eliminate in the urine up to 5 Gm. of the intravenously administered 40 Gm. of galactose. Patients with parenchymatous icterus or with pernicious anemia who show agalactosuria after an oral tolerance test show a typical galactosuria following intravenous administration. The authors conclude from this that the agalactosuria after the oral test is caused by deficient intestinal resorption. In case of renal lesions, the galactosuria is low even after intravenous galactose tolerance tests.

Zentralblatt für Gynäkologie, Leipzig

60: 1633-1680 (July 11) 1936

Abdominal Cesarean Operation: Its Present and Future. E. Puppel.—p. 1634.
Results of Treatment, Particularly of Radium Therapy, in Carcinoma of Uterine Cervix. W. P. Plate.—p. 1638.
Chorion Epithelioma: Case. L. G. Steigelmann.—p. 1639.
*Substitute for Blood in Profuse Abdominal Hemorrhages. O. Hajek.—p. 1643.
Interstitial Tubal Rupture: Case. R. Leupold.—p. 1652.

Substitute for Blood in Abdominal Hemorrhages.—Hajek points out that the reinfusion of the blood which accumulates in the abdomen in ruptured tubal pregnancy was first recommended by Thiess. The advantages of this reinfusion over transfusion were so pronounced that the method soon found wide acceptance. To be sure, there also were some failures, but these were usually traced to some defect in the technic and efforts were made to improve it. The author reviews several methods that have been suggested for the preparation of the blood and then shows that the reinfusion itself has been done with different apparatus. After discussing some of the complications that have developed in connection with the reinfusion, he directs attention to the technic suggested by Knaus, who aimed at reintroducing the blood as nearly as possible in its physiologic condition. Knaus employs neither defibrination nor dilution with sodium chloride, Ringer's solution or sodium citrate. By dispensing with these procedures he not only prevented impairment of the blood but also simplified the method considerably. Following opening of the abdomen, Knaus takes up the blood into a sterilized apparatus consisting of three parts, the upper being a sieve, the middle the blood container and the lower containing water at 40 C. to keep the blood at the proper temperature. The sieve separates the fluid blood from the coagulated blood. The fluid blood thus obtained is introduced into the vein of the arm as in case of blood transfusion from man to man. The author says that no further complications have occurred since this method of reinfusion was introduced at his clinic.

Problemy Tuberkuleza, Moscow

Pp. 915-1044 (No. 7) 1936. Partial Index

Growth Morphology of Lymphatic Nodules in Relation to Morphology of Tuberculosis. L. O. Vishnevetskaya.—p. 917.
Vegetative-Nervous Tonus and Functional Capacity of Cardiovascular System in Tuberculous Patients. T. D. Kan and Ya. M. Brailovskiy.—p. 948.
State of Vegetative Nervous System in Children with Pulmonary Tuberculosis. M. P. Pokhitonova.—p. 959.
*Indications for Operation of Jacobeus. P. N. Altshuler.—p. 965.
*Blood Plasma Transfusion for Arrest of Pulmonary Hemorrhage. O. S. Kazarnovskaya and V. I. Mordvinkina.—p. 973.
Fatal Pulmonary Hemorrhages in Tuberculosis of Children. I. M. Factorovich.—p. 977.

Thoracoscopy with Severance of Adhesions (Jacobeus' Operation).—Altshuler analyzes the results of 165 thoracoscopies with or without cutting of the adhesions performed in the last three years in the surgical division of the Central Tuberculosis Institute. The majority (ninety-nine) of the patients presented a bilateral disseminated or fibrous cavernous process. Only one third (fifty-two) presented a unilateral involvement. The operation was performed in 117 cases because of cicatrices which prevented the collapse of a cavity and because of the presence of tubercle bacilli in the sputum. It was performed in sixteen cases because of adhesions that were deforming the collapsed lung and because of the presence of tubercle bacilli in the sputum, despite the fact that the existence of a pleural cavity could not be demonstrated either clinically or roentgenologically. Adhesions were the sole indication for operation in fifteen cases. The adhesions were responsible in

those cases for the continuance of toxic symptoms, such as temperature and moderate blood spitting after reinflation. In two cases the operation was performed for a persisting exudative pleuritis. The operation of thoracoscopy with cutting of adhesions gave positive mechanical and clinical results in 64 per cent. It brought about obliteration of the pleural cavity, disappearance of tubercle bacilli from the sputum and toxic symptoms. Reinflation had to be done, but the patients felt well and were able to work. Collapse of the lung was improved in thirteen. In 3 per cent of the patients a supplementary phrenico-exeresis had to be done to obtain a satisfactory collapse. The author considers the following absolute indications for thoracoscopy: 1. The presence of cicatrices that deform a cavity and tubercle bacilli in the sputum. 2. When, in the absence of a demonstrable pleural cavity, there exist adhesions that deform the collapsed lung and when tubercle bacilli are present in the sputum. 3. When, in the absence of tubercle bacilli in the sputum and a demonstrable pleural cavity, toxic symptoms persist that can be explained on the basis of trauma of tuberculous foci resulting from cicatrizing adhesions. 4. Persistent or recurring pneumopleuritis in the quiescent period. In such cases adhesions frequently traumatize the pleura and interfere with the subsidence of the inflammatory process. 5. Failure on the part of the pleural cavity to become obliterated even if roentgenograms do not demonstrate the presence of adhesions. Among the relative indications he mentions (1) the presence of cicatrices in an otherwise satisfactory artificial pneumothorax, (2) protracted pneumopleuritis in the quiescent period without roentgenologically demonstrable adhesions, (3) certain cases of spontaneous pneumothorax caused by the rupture of an adhesion close to the visceral pleura (thoracoscopy here has a diagnostic as well as a therapeutic value), (4) the cutting of the adhesion, which permits the lung to collapse and the perforation to close, and (5) before an induction of an oleothorax in order to demonstrate the condition of the pleura. Hyperemic pleura points to activity of the inflammatory process and therefore to continuation of exudation in spite of introduction of fat (oleothorax).

Blood Plasma Transfusion for Arrest of Pulmonary Hemorrhage.—Kazarnovskaya and Mordvinkina report ninety-six transfusions with blood plasma in fifty-three patients. Thirty-three of the patients had a persistent profuse bleeding, which had resisted the various hemostatic measures, such as administration of calcium chloride, autohemotherapy and horse serum. The amount of blood plasma infused at one time amounted to from 20 to 40 cc. Hemorrhage was arrested after one transfusion in thirty-one cases, after two in nine cases and after three in eleven. The method failed in two instances. It was thus effective in 96 per cent. The plasma was secured from the Leningrad Institute for Blood Transfusion. It is prepared from donors of groups A and B. It does not contain agglutinins and can be given without regard for the blood group of the recipient. It does not produce anaphylactic reactions on repeated injections. It differs from serum in that it does not contain fibrinogen. The advantages of the method claimed by the authors are the small dose required, the rapidity of action, the few general reactions and total absence of focal reaction. Infusion of blood plasma has the effect of increasing blood coagulability, the lowering of which constitutes one of the most important factors in the complicated mechanism of pulmonary hemorrhage.

Norsk Magasin for Lægevidenskapen, Oslo

97: 897-1000 (Sept.) 1936

*Reticulo-Endothelioses and Reticulo-Endotheliomas in Lymph Nodes. F. Harbitz.—p. 897.
Nonparasitic Cyst in Spleen: Case. K. Schanke.—p. 912.
"Granulosa Tumors." A. Grevle.—p. 918.
*Stenosis of Aortic Isthmus: Two Cases. E. Blegen.—p. 927.
Internal Derangement of Knee. P. E. Giertsen.—p. 938.
Roentgenologic and Combined Roentgenologic-Surgical Treatment of Cancer of Tongue: Three-Year Results. R. B. Engelstad.—p. 946.
*Ischiopubic Osteochondritis. J. Torgersen.—p. 951.
*Nervous Disorder with Fatal Outcome After Spinal Anesthesia, with Symptom Free Interval of Four Weeks: Case. D. Elstad.—p. 959.

Reticulo-Endotheliomas in Lymph Nodes.—Harbitz says that there are conditions in the lymph nodes originating from the reticulum which are not related to tuberculosis or to lymphogranulomatosis and its atypical forms or to other known inflammations or tumors. Diagnosis can be made only by the microscopic structure and by exclusion. These disorders of the lymph nodes are partly hyperplastic processes at the start but show transitions to malignant tumors in their later development. Temporarily they may be called reticulosarcomas or reticulo-endotheliosarcomas if histologically agreeing with tumors. The prognosis is doubtful; they often recur after extirpation and appear rather resistant to irradiation in that recurrence is frequent after this treatment. These conditions, the author says, seem to be of considerable importance and should be distinguished as a separate group. He gives a classification and reports six cases. The first three represent hyperplasia of the reticulo-endothelium, one in a boy, aged 14, with general trichophytosis and progressive enlargement of the lymph nodes, the second in a woman, aged 27, with probably benign enlargement of the lymph nodes in the neck, and the third in a woman, aged 31, with chronic enlargement of the lymph nodes in the neck. The last three cases represent reticulo-endotheliomas and reticulosarcomas, the first in a woman, aged 62, with progressive disease of the lymph nodes of the breast and infiltration in its papilla, with death after three years; the second in a man, aged 46, with tumor in the cervical glands, fatal after two years, and the third, in a man, aged 29, with tumor in the lymph nodes of the neck and later general spreading, fatal after fifteen months.

Stenosis of Aortic Isthmus.—In Blegen's two patients, a man aged 36 and a woman aged 34, there were typical signs of the lesion. The first patient, who died from hemorrhagic diathesis, showed definite signs of another congenital lesion in Gee-Herter's disease. Examinations revealed blood calcium as low as 3.4 mg. per hundred cubic centimeters, whereas six months earlier it had been 7.8 mg. He says that, although hypothrombinemia is not excluded, the grave hemorrhages are ascribed to the low blood calcium. The diagnosis of aortic coarctation was verified on necropsy. No anatomic substrate for Gee-Herter's disease was found. The atrophic spleen (weight, 20 Gm.) without signs of normal structure may be considered related to the intestinal disorder or an independent anomaly, and the presence of abundant Jolly's bodies in the red blood corpuscles may be connected with the spleen.

Ischiopubic Osteochondritis.—Torgersen reports two cases in children aged 8 and 9 years. Roentgen examinations show a nut-sized swelling of the synchondrosis, sclerotic at the border and vacuolic in the center. Ischiopubic osteochondritis is a disorder of children in the synchondrosis between the lower branch of the pubis and that of the ischium. It was singled out as an entity by Van Neck and studied more closely by Heeren and has been described only once before in the Scandinavian literature. While the disorder is relatively rare, it is common enough to be considered in differential diagnosis of disturbances in the pelvis, and, when clinicians and roentgenologists become more familiar with it, it will be diagnosed more often. The symptoms are pain in the inguinal region on walking. The roentgenograms of ischiopubic osteochondritis and of osteomyelitis are similar, but in osteomyelitis there is no sclerotic border zone. All roentgenograms in ischiopubic osteochondritis show that the two bones have begun to touch; in some cases ossification is strikingly unsymmetrical. The author thinks that the disorder may be caused by a mechanical factor. It probably predisposes to secondary infection; when ossification occurs, the pain ceases and the danger of secondary infection is past. The prognosis is good. Treatment may be limited to guarding the patient against overexertion and to correction of possible static defects.

Fatal Nervous Disorder After Spinal Anesthesia.—Elstad states that four weeks after appendectomy, done under spinal anesthesia in a man aged 42, marked neuralgia-like pains suddenly began in the right leg, partly also in the right arm, accompanied by violent headache and double vision and colic-like pains with vomiting. The pain soon abated, but paralysis of the right upper and lower extremity and the right facialis and abducens nerves developed, increasing in two days to complete paralysis of the right side, together with slight paralysis of the left lower extremity. Death was due to respiratory paralysis. The author says that, while the spinal anesthesia might seem the probable cause of the paralysis, the long latent period before appearance of the symptoms is unexplained.